NEVADA.

HISTORY.

The occupation of the pasture lands of Nevada began with the movement from the eastern states which the discovery of gold in California excited. The emigrants to California who crossed the plains in 1849 halted their wagon-trains in the valleys of western Nevada, and, availing themselves of the fine natural pastures, often recruited their exhausted work animals before attempting the toilsome passage of the Sierra Nevada. Carson valley, Eagle valley, and the Truckee meadows, lying almost directly on the route of this early emigration, were the first localities within the limits of the present state to furnish more than temporary grazing to neat cattle. Not many work oxen or stock cattle accompanied the hurried travel of the gold seekers in 1849; in 1850, however, and until the railroad was built, cattle, both in the yoke and driven loose, entered with the tide of emigration. In 1851 Captain H. A. Parker, a wagonmaster in the employ of Ben. Holliday, wintered in Carson valley with a train of freight animals from Salt Lake, intending to push on in the spring for the diggings. With this train were driven three milch cows of American breed, which are believed to have been the first stock of the kind to pass a winter in that country, all stock previously driven through Nevada having been merely temporarily pastured and then taken on to the mines.

The following year, 1852, a few emigrants who remained in Carson valley to trade with those passing through are said to have wintered about 30 milch cows and a few hogs, originally from Missouri and Illinois. Among these settlers was C. D. Jones, who brought in 12 head of long-wooled Missouri sheep, the pioneer stock according to Captain Parker, who saw them and knew of their permanent location in the neighborhood of Genoa. From that season, as the occupation of Carson and Eagle valleys by emigrants slowly increased, live-stock continued to be held by the permanent settlers, while many bands of cattle and sheep, driven from the states and from the Mormon settlements in Utah, were held for a few days or weeks on reaching these well-grassed sections to rest and recuperate. The incoming of several Mormon families in 1855, each bringing from 25 to 40 head of Utah cattle, added to the stock held by ranchmen, which, according to the testimony of one of these people, numbered in the two valleys about 1,000 head of American blood, beside emigrant stock wintered from the overland trail.

The cattle and sheep which entered Nevada up to 1858, either to graze in transit or as the property of settlers, were wholly of American breeding, except, perhaps, work cattle employed in freight trains. The advent in the spring of 1858 of two droves of beeves, numbering 1,500 head, and driven from California by Messrs. Dorsey and Nottinger and L. B. Drexel, was a new feature in the stock interest. The owners wintered their herds in Carson valley and Truckee meadows, and crossed the Sierra with fattened bullocks in the following spring, as beef was in great demand at the mining camps. Other droves from the east and from Utah during 1858 are said to have increased the herds of the settlers, and in the winter following there were about 2,000 head of cattle in Truckee meadows, while the settlers of Carson valley and Eagle valley together held an equal number. In the year 1859 cattle were driven into Smith and Mason valleys, in Esmeralda county, and Honey Lake and Long valleys in the north. Various herds were brought from other sources, as 2,000 California cattle from the San Joaquin valley and a herd of 1,200 Missouri and Arkansas cattle brought to the Walker river and 400 California cattle to the Antelope valley. Cattle were driven from California to Nevada in 1859, including 200 originally from Texas. The purpose of their adventurous owners was to breed and fatten beef for the California mines. Their first intention was diverted by the springing up in 1860 of a local market incident to the discovery of rich gold placers in western Nevada. The stock-owners, wholly unprepared for the extraordinary winter of 1861–'62, sustained heavy losses, especially on the Truckee meadows and in Carson valley. Of 3,200 Illinois sheep, brought in the fall, only 500 survived the winter, while in the same locality one-third of the cattle in some herds were lost by exposure and starvation. Snow lay in the western valleys to the depth of 2½ feet for several weeks, and was badly crusted. An attempt was made to break trails toward the range about Pyramid lake, and some cattle were moved to less dangerous pasture grounds.

The beef from the surviving herds sold at the newly opened mines for prices which it is said compensated for the losses of the winter. Little stock of any description reached Nevada from the east during 1860, as the Piute Indian war checked the progress of droves intended for California. From the west, however, droves of cattle and sheep entered, encouraged by the demand at Silver City. During the winter of 1862–'63 a flock of 3,000 Chihuahua sheep, brought in from California, was ranged on Truckee meadows. This was the first extensive flock brought into Nevada for the purpose of breeding. While western Nevada was experiencing this gradual settlement the Mormon interests were also advancing in the eastern part. In 1859–'61 the Mormons entered Meadow valley with limited stocks of sheep and of cattle and established permanent settlements at Panaca City and on the Muddy river.

The development of the Comstock lode, opened in 1861, brought thousands to the country, and created a market for beef and mutton scarcely equaled in extravagant prices by the early days of the gold excitement in California.

When in 1864 California suffered from a disastrous drought, large numbers of cattle and sheep sought refuge in Nevada. Their owners, finding the ranges of the western valleys already occupied, pushed on and occupied new pasture grounds. At this time Churchhill county, portions of the Humboldt valley, Reese river, and Big Smoky valley, were invaded by stock driven in by old Californians. The announcement of rich mineral prospects at Austin in 1863, in the Pahranagat district in 1865, and at White Pine in 1866, induced the advance of cattle and sheep into the valleys adjacent to these districts. The excitement at Eureka and at Pioche in 1869 brought an increased population into eastern Nevada, and in a few years caused the stocking of all the available pasture in that portion of the state.

A great quantity of beef was consumed between 1864 and 1873 in the different mining districts throughout Nevada. The local production was wholly inadequate to supply this consumption. Oregon, in 1864 or 1865, first sent beef-cattle to the Comstock mines, while Utah, which had since 1861 profited by the same demand, between 1864 and 1869 sent out many herds and flocks to occupy the eastern valleys of Nevada. Two thousand five hundred Texas cattle reached White Pine county in 1868, followed by annual drives direct from Texas, where cattle could be bought for $5 to $7 each, and were worth in Nevada $18 to $20, by the drove, direct from the trail.

The year 1870 was memorable in Nevada for a large immigration of both cattle and sheep from California, whence a drought compelled a great exodus of stock. During that and the following year the pastures of Nevada were fully utilized. The Quinn river country received in 1870 several large herds of neat cattle from Mason valley, California, and from Texas. Sheep entered the same section in 1871. Nevada continued to receive stock-cattle from California, Oregon, and Texas up to 1874, when Texas importations ceased, and California also ceased to supply any large number, and there was a change in the cattle industry of the state. Since 1861 a large mining population had consumed not only the surplus beef and mutton of Nevada, but had necessitated a large importation from other regions, while the construction of the Central Pacific railroad had for several years added to the local demand. Its completion in 1869 had opened the way for shipment of fat cattle to San Francisco and Sacramento.

The pasture ranges of the state in 1872 and 1873 were fully stocked and contained more cattle and sheep than at any previous time, and in 1874 a decline in prices occurred. Pastures were now crowded, particularly during the winter season, and in many sections were deteriorating from overstocking. In 1875 several large cattle-owners moved their herds into Idaho, while other stockmen sought new locations in southeastern Oregon and in Montana. A few droves found a market in Wyoming and northern Colorado. From 1876 to 1879 a limited movement continued of stock toward the north and of both beef and breeding herds to Wyoming. For several seasons the pasturage had suffered from overgrazing and severe droughts. This caused a considerable movement in 1879, and in the following season, 1880, after the experience of a disastrous winter, the increased alarm occasioned a regular stampede of the surviving stock from many valleys where the mortality had been excessive. Those who could not sell advantageously started with their cattle for the Wyoming market, or to establish new stock camps on some eastern range. North of the Humboldt river, where the country was controlled by comparatively few heavy stock-owners, there was not the same cause for apprehension, and the exodus of stock was much less general, although a number of herds joined in the drive over the eastern trail and swelled the number to more than 20,000 cattle in the season of 1880.

This grazing region originally furnished excellent opportunities to the grazier. A common use of government land, popularly called "free range", and a good home market resulted in excessive grazing, and rendered many wide areas of Nevada south of the Humboldt river wholly unfit for more than a limited stock occupancy.

As to the recuperation of exhausted pastures, the testimony of observing men shows that in some localities, at least, which were badly pastured down ten years ago, the bunch-grass, sand-grass, and white sage, constituting the stock feed of Nevada, have failed to regain their former condition.

The state of Nevada is considered in three sections: Northern, lying north of the Humboldt river; central, lying between the Humboldt river and the northern limits of Lincoln, Nye, Esmeralda, and Douglas counties; and southern, including all of the state situated south of the central portion named. It must be remembered that Nevada lies wholly in the Great Basin. The outward drainage is limited, most of the area being without running water except as it is lost in sinks. In the northern part a portion drains into the Snake river, while the Colorado river touches the state on the southeast. Vegetation is sparse, requiring a relatively great area for the support of stock, and with so little timber as to make no appreciable per cent. of the area.

NORTHERN NEVADA.

In northern Nevada, above latitude 41°, a good quality of grazing land prevails. The native grasses and other feed have sustained great injury from overstocking, in common with southern and central Nevada. The original capacity for supporting live-stock seems to have been greatest in northern Nevada at all seasons of the year. No other part of Nevada possesses such extensive tracts of elevated and well-watered summer pasture as those adjacent to the valley lands of Quinn river, the Owyhee, and the northern tributaries of the Humboldt. The great divide between the headwaters of the Bruneau and the Humboldt rivers constitutes a summer resort for several of the largest cattle herds in the state. Northern Nevada experiences difficulty in carrying its stock through

the winter in good flesh. A noticeable feature of stock-raising in Humboldt and Elko counties is the comparatively limited number of small stock-owners. The business is mainly concentrated in the hands of a few wealthy ranchmen who control a majority of the best water privileges. Grants of land by the United States to the state of Nevada at different times amount to about 2,661,000 acres, including the "Lien Land" grant, approved June 16, 1880. The settlement or occupation of a majority of the best lands occurred years ago. Titles from the state were secured, usually covering a limited acreage of land situated adjacent to water, and costing $1 25 per acre. Ranchmen regarded the price as altogether too high for any but meadow-land or such water claims as insured them extensive grazing facilities, and, as a consequence, there were few purchases made to include upland pasture. Such expense was practically unnecessary, provided strips of land on both sides of the water were secured. Pre-emption and homestead entries were popular among farmers and small stockmen, but in the case of ranchmen owning large herds such titles gave too limited a possession to suit their purpose, and the state lands were bought in preference. In the words of a prominent stock-raiser, discussing the system of land-tenure in Nevada: "Pre-emption and homestead laws were not made for the use of stockmen. No large owner can live on 160 or 320 acres of land unless under most favorable conditions. Such restriction would kill the stock industry. The desert-land act, giving a title to 640 acres, is a better provision", but practically inadequate, according to the same authority. The choicest tracts of river lands have in many instances been fenced with barbed wire for the production of hay and as pastures for stock peculiarly susceptible to exposure. The country watered by Quinn river and its tributaries furnishes a notable example of the control of extensive water privileges. Inclosed areas of meadow and river land amounted in 1880 to 11,000 acres in one instance, 6,000 in another, and 5,000 in a third. In the neighborhood of Battle mountain two instances were met with of inclosing both the bottom lands and a considerable extent of upland pasture contiguous to them. One ranch located on Rock creek was said to hold 120 square miles under fence, while another on the main Humboldt comprised 50 square miles of grazing-land. The proximity of railroad transportation had enabled the owners of these cattle ranches to fence relatively cheap with wire and California red-wood posts. Abutting their fences against certain neighboring and abrupt hills, they had inclosed portions of the entire breadth of the valleys in which they were located.

These fenced areas were only used during the cold season, as the herds were held on open ranges for summer grazing, with the exception of small bands of choice cattle used for breeding. At various points along the upper waters of the Humboldt river, in Elko county, other prominent cattle-growers have adopted fencing with wire. They each own or control in this way pastures containing as much as 30,000 acres of river and valley land. This requires an expenditure of money which the small owner cannot command.

ROOP COUNTY.—Roop county, for judicial and tax purposes, is attached to Washoe county. Its own resources would be inadequate for the support of the numerous flocks which winter west and north of Pyramid lake but for the Sierra Nevada, where forage is found during the summer months. This region, south of latitude 41° 20′, may be regarded as one vast sheep-walk, with a far greater density of occupation than any other part of the state. No considerable herds of cattle in this county in 1880 ranged south of the 41st parallel. Flockmasters asserted that the prevalence of browse-feed on the winter ranges favored their business, while in the mountains sheep were easier to manage. The absence of living water over large portions of the county and its comparative scarcity everywhere have made it impracticable to establish many permanent ranches. The distinguishing feature of the sheep business, therefore, is the migratory condition of the flocks. They are moved periodically for a change of grazing, and occupy ranges less accurately defined than on the Quinn river or in Paradise valley, where flockmasters in some cases own valuable ranch claims, and range their sheep in their vicinity. Owing to this nomadic tendency among sheep-owners, the stock naturally received less careful attention than in the other localities named. The losses among flocks in the winter of 1879–'80 were serious, and the mortality among adult sheep had been followed by a very limited increase, amounting, it was asserted by well-informed flock-owners, to not over 40 per cent. throughout the region. The wool-clip was also much below the average yield, both in the total amount and in the average shear per head. The northern portion of Roop county above 41° 20′ contains grazing areas supplied more abundantly with springs and small streams, permitting occupation by cattle-owners. In Coleman valley, Guano valley, Massare valley, Long valley, Deep Hole, Buffalo cañon, High Rock cañon, and several other localities cattle ranches have been located and more or less improved, according to the nature of the local water-supply. Generally speaking, the flow of running streams or of springs is limited, and meadow lands are of small extent. Exceptions occur, as on Duck Flat and in the Deep Hole neighborhood, where two ranches cut each upwards of 300 tons of wild-grass hay in favorable seasons. No effort seems to have been made in this vicinity to control grazing-land by fencing, and the limited meadows referred to are the only areas inclosed. Fencing, when used for inclosing hay-land, consists of boards or poles of pine with cedar posts, and in one or two instances stone walls have been constructed. The stunted timber furnishes but a meager and a costly supply of building and fencing material.

A ranchman in Coleman valley was handling at the time of this investigation 2,200 head of cattle; another in Long valley controlled 2,000 head, while several cattlemen in Guano valley, Deep Hole, and Buffalo cañon, respectively, had herds of 1,000 to 1,600 head. Sheep flocks, each amounting to 8,000 animals, were owned by at least ten stockmen, while several flockmasters owned 4,500 to 6,000 each. Cattlemen in northern Roop county make a practice of driving their beef to Reno, on the Central Pacific railroad, and either ship the stock to California

markets or dispose of them to local buyers. Some few hundred head of bullocks are annually "put up" on hay in the southern valleys and fattened for Virginia City, Carson, or Reno markets. The wool of the region is brought by freight-wagons to Reno, and is thence shipped through the agency of forwarding merchants either to San Francisco, or, by the way of Sacramento, to the eastern wool depots. The disposal of mutton-sheep is a matter of much uncertainty in western Nevada, since California has a home supply and the Nevada trade is limited.

In the spring of 1880 there was an importation by railroad from California of 6,357 sheep, mostly for mutton, occasioned by the scarcity of fat wethers in western Nevada. The high price of hay during the summer months of 1879 prevented the usual number of mutton-sheep from being fed on the Truckee meadows and in other localities, while the hardship of the following winter prevented range animals from keeping fat. The southwestern portion of Humboldt county is much less fertile in grass or meadow land than the northern portion.

At the base of the eastern slope of the Granite mountains, where a few springs and small streams furnish water, several cattle ranches have been located for a number of years. Their stock, aggregating about 6,000 head, use the hill pastures for summer grazing, and in cold weather, particularly if the snow is deep, push out into the dry sage-brush plain and valleys toward the east and north, where there is less snow and where browse-feed, scattered bunch, and sand grasses furnish tolerable winter grazing. They often meet the Quinn river cattle on the ridges of the Black Rock desert, while toward the Humboldt river they sometimes mingle with the estrays from ranches along that valley, so that almost the whole of this badly-watered section has to be worked by rodeo in the spring. Between the Granite mountains and the Humboldt river scarcely any permanent natural water exists except in the Trinity and the Eugene mountains. The country consists for the most part of alternate low hills with sage-brush valleys between, both equally destitute of more than occasional water. From just above the Churchill county line toward Humboldt sink and south for 30 or 40 miles a veritable desert stretches, containing many alkaline flats and sand-wastes without water. This region is well remembered by early emigrants to California for its disastrous effects upon work-animals weakened by the long journey. The mountain ranges in this region, known as Quinn River mountains, occupy the whole northern part of Humboldt county, extending from the Cottonwood mountains on the east side nearly to King's river, the Roop county line on the west. Bilks creek, Alder creek, Reynolds creek, Crane creek, and Jackson creek, all of which, at high water, run into Quinn river or toward its sink, furnish a water supply in their respective neighborhoods. Large cattle-owners have taken up permanent claims on them, making substantial improvements by fencing and by irrigation. In the Quinn river valley proper two of the largest flocks of sheep in Nevada were held in 1880, and also several among the largest herds of neat cattle in the state.

A large part of the beef from this county is driven to the railroad at Reno or Winnemucca, and consigned to San Francisco. It comprises every class of fat cattle, from two-month-old calves to mature beeves. Thus in 1879 one establishment on Quinn river drove to Winnemucca and shipped thence to California during the summer and fall 400 two-year-old steers and 400 winter and spring calves for veal, thus checking overstocking. One lot of 1,200 Oregon-bred steers left this range the same season, and was shipped at Winnemucca for Iowa for feeding. A considerable number of steers from herds on the west side were driven to Truckee meadows and then "put up" for the California winter market. Beef from the range is usually in condition to ship from July to the last of November. One ranch at the mouth of Willow creek, on Quinn river, cuts about 1,000 tons of wild-grass hay.

The way-bills of the Central Pacific railroad showed that the shipment of cattle east numbered 6,168 during the summer of 1880, two-thirds of which were Quinn river cattle, purchased by a Nebraska shipper, together with several small droves of Humboldt valley cattle. The general conduct of cattle-raising is almost identical with that prevailing in Baker and Grant counties, Oregon, which lie contiguous. On either side of the line are herds owned by ranchmen on the other side. The breed of cattle, superior to the average in Nevada, is the same in both cases.

The liability of stock to drift before winter storms and to stray at all times off their range obliges the co-operation of large owners, whose crews of vaqueros often work in common over a wide extent of country either side of the state line. The operation of "spaying" was performed in 1879 on 640 head of cows owned at a ranch on Reynolds creek, and on another lot near camp McGarry. The loss resulting from the operation was said to be slight, although the animals were mostly old cows, and they were sold the following season. Several cattle-breeders, who, in the course of their stock operations, had handled a few Nevada cattle treated in this way, gave it as their opinion that the quality of spayed beef was usually finer than that of steers, and that almost invariably the spayed cow carried the most fat in proportion to the weight of meat, under the same conditions of natural feed, especially if spayed when a calf or a yearling. These authorities stated that up to three years of age these grass-fed cows compared very favorably in weight with the steers, but that after this period the larger frame of the steer gave him the advantage in weight.

The ranges at the beginning of the winter of 1879–'80 were more heavily stocked than ever before, and the browse-feed, bunch, and sand grasses had been also injured by the summer's drought. Throughout the upper valley of Quinn river, from the mouth of King's river to the Oregon line, the estimates of owners placed the loss among neat cattle at 20 to 25 per cent. Lower on Quinn river and in the western and northern parts of Humboldt county the mortality was not so large, but was said to average 17 per cent. The class of cattle which suffered most were old cows and heifers heavy with calf, or those that dropped calves during the winter. Not over 5 to 8 per cent. of

steers and dry cows perished. A result of all this was a light branding of calves during 1880. A less serious loss was sustained among sheep on the east side of Quinn river valley, where the owners had put up hay and had inclosed pastures for flocks in stormy weather. They claimed to have brought 92 per cent. of their stock safely through the winter. In spite of the losses sustained in that winter, the aspect of affairs was encouraging in 1880.

The Quinn river cattlemen, several of whom have interests in certain slaughtering establishments in San Francisco, are improving their herds through better cattle and better care. In the eastern part of Humboldt county and north of the Humboldt river are three considerable valleys, Paradise, Eden, and Clover (*a*); in Paradise valley, on the little Humboldt, farming has the precedence. This valley is one of the most fertile basins in Nevada, and produces every year considerable wheat and barley in its central portion, and a large amount of hay is cut on the extensive meadows bordering the streams. The settlers have developed the resources of the valley by irrigation and by fencing, and are generally prosperous farmers, many of them owning also good-sized herds of cattle or sheep. As timber is costly and difficult to obtain, a large area of cultivated land is unfenced and exposed to the depredations of stock. For this reason all the herds are driven to the Cottonwood mountains on the west and the high lands lying north and east, in summer, where water and grass are fairly abundant and of good quality. During winter, however, the available range is much more confined, and in Paradise valley and in Eden valley there were heavy losses during 1879–'80, the result of a concentration of too many cattle and sheep on an area restricted even more than usual by the conditions of that season. The high land between the little Humboldt and the Owyhee river slopes toward the latter stream into a vast sage-brush plain, known as the Owyhee desert. Many of the valley herds resort to this so-called desert and pass the winter well, provided they can find snow in place of water. There was little snow in the long, cold winter of 1879–'80, and large tracts of the browse-feed, both in that region and in the valley slopes, could not be occupied; herds were compelled to remain in the neighborhood of permanent water, where the feed was already eaten off. Cattle-owners stated that 20 per cent. of their herds perished from combined cold and starvation, although all the hay and straw in the two valleys was used. Among sheep the mortality reached 15 per cent., according to the estimates of flock-owners. The slighter loss of this stock was due to their ability to endure cold, their partiality for varieties of browse which neat cattle reject, and the possibility of directing sheep more readily than cattle to a change of range. The flocks of this region are composed of grade merinos, in most instances well improved and handled with much care. The aggregate in 1880 was about 18,000 head of sheep in Eden and Paradise valleys. The wool was sent to California, while the mutton-sheep were sold to local consumers or driven to other regions. It is common in Nevada to keep the wethers for their wool until they perish of old age. The development of agriculture in Paradise valley has gradually limited the area of valley range accessible to cattle during the winter. In Eden valley farming interests have developed to a much less extent. Considerable dissatisfaction was noted among the cattlemen, owing to the alleged injury to pasture by sheep. The country adjacent to these valleys on the west, north, and east presents ample facilities for holding stock during summer, and is not adapted to other purposes. The narrow limits of the winter pasture are already overoccupied. Like almost every other pasture region in Nevada, Utah, and Idaho, the advantages which these hill and mountain grazing lands afford in summer are far in excess of the capacities of the low lands and valleys for wintering stock. But a well-grassed and roomy summer range has in many localities tempted ranchmen to overstock.

The extension of the Humboldt valley northward to the prongs of Evans creek is known as Clover valley. (*a*) Although since 1871 this locality has carried neat cattle with success during the hardest season of the year, it proved very disastrous for certain flocks of sheep brought in from California in 1871–'72. During the winter of 1874–'75 several flocks were almost annihilated by heavy storms, and this caused the subsequent withdrawal of most of the survivors to California, Montana, and Colorado.

Several large cattle ranches have maintained practical control of the upper portions of Clover valley and of Squaw valley, in which the northeastern fork of Evans creek takes its rise. Until its wild forage was reduced by winter occupation by large herds of cattle the grazing was considered excellent, but in 1879 it was deemed advisable to reduce the stock, and many were sent to California. This movement was resumed in 1880, some cattle going toward the east, resulting in reducing the valley herds fully 50 per cent. Fully 14,000 head of cattle are said to have been removed beyond the state from this region during two years, a reduction which was further augmented by the mortality resulting from the long and severe winter of 1879–'80. The hill forage is still good. The area adapted to stock occupancy is very large among the mountains on the north and east, but the valley proper has been closely fed. Browse-feed formerly prevailed in abundance throughout many of the slopes and flats, while considerable stretches of meadow land furnished a varied and profuse feed of wire, red-top, and rye grasses.

The decline in the herds of ranchmen in 1880 compared with the returns of live-stock to the county assessor in 1879 was 50 per cent. While the tax-rolls of a county are poor authority as to the actual number of animals, they are valuable when severe losses occur. The majority of herdsmen shipped all the available beef in 1879.

The divide between the river systems of the Columbia and the Humboldt generally forms a cattle range during six months of the year. But few steep or inaccessible mountains exist to prevent the free movements of herds during the summer season. In the process of settlement large areas of browse-feed and meadow grasses formerly

a There are two "Clover valleys" in Nevada, one north and one south of the Humboldt river.

existing as common pasture have been withdrawn from the free range and appropriated to the uses of small proprietors. A dozen energetic ranchmen now hold three-fourths of the cattle north of the Humboldt river, on Rock and Boulder creeks, Susie and Maggie creeks, and the north fork and the main Humboldt; these persons own an immense acreage of land.

Near the Idaho line cattle along the Humboldt river drift across the boundary, and for several years previous to 1880 it was customary for Elko county owners to move their herds into Idaho and winter them in the valleys of the Bruneau and the Salmon rivers.

The Owyhee river flows through a vast sage country, containing many stretches of browse accessible to cattle, where they can find drifted snow in ravines and pockets. Along the stream are frequent cañons until after the Oregon line is reached, which permit only an occasional opportunity for reaching water. The prongs of the south fork, however, have several cattle ranches located on them, with good summer grazing, but during the other half of the year they must depend on overgrazed lowlands. With the progress, however, of settlement by small ranchers, under the pre-emption or the homestead acts, wherever there is opportunity for irrigation the free-range opportunities have been curtailed.

The advantageous conditions already gained by actual title to river borders enabled a dozen cattle-raisers each to handle herds aggregating from 10,000 to 15,000 head. California is the market of the beef-cattle turned off from these ranges, although during the past three years, and particularly in 1880, many, both stock and beeves, were sold in Wyoming. The shipment of 800 choice steers from Halleck to Chicago was made by two prominent cattlemen in 1878, but it is said at a loss. Freight charges on cattle billed for Chicago from Halleck were $260 per car, while to San Francisco the rates were $120, exclusive, in each case, of expenses incident to unloading and feeding the stock, an item of consequence in the transit of beeves for long distances.

Sheep-raising was not prominent in 1880. Several years ago the custom was general among sheep-growers in eastern Nevada of ranging their flocks north and south, after the nomadic fashion common in Utah. They reached the railroad in season to shear, and again moved to a fresh pasture, eventually, as winter came on, resorting to the ridge of the Great Salt Lake desert, where white sage, button sage, and greasewood afforded pasture. In 1880 there were only 5,500 sheep returned for taxation, and probably not over 8,000 head were actually owned in the county, several flocks having been driven to Montana in 1879. There was much complaint among stock-owners along the Humboldt, Thousand Springs, and Goose Creek valleys that the immense drives of emigrant sheep consumed the forage while in transit for Montana and Wyoming during 1878–'79–'80. Wherever these trail flocks found open water, from their numbers and their voracity, they left a trail, as a ranchman expressed it, on which a grasshopper would starve.

CENTRAL NEVADA.

The central section embraces the country extending south of the Humboldt river to the northern boundaries of Lincoln, Nye, Esmeralda, and Douglas counties. The prominent characteristics of this wide region in their relation to live-stock and grazing resources were, in 1880, a decreasing occupation by cattle and sheep, and a much deteriorated pasturage. Its topography displays an alternation of valleys and mountain ranges, generally sufficiently watered to permit the periodical movement of live-stock from a summer to a winter range, although there are large tracts both of plain and of upland so barren as to make them practically worthless for grazing. Alkaline flats utterly destitute of grass occupy a large area of country. The borders of the Great Salt Lake desert render eastern Elko county unsafe for cattle-ranging, though sheep, which can be more readily controlled, are sometimes wintered there. It is impossible in a country like Nevada to sharply draw the line between districts which can be and those which cannot be occupied by stock. A region may furnish pasturage in some years and be totally barren in others. During winters accompanied with abundant snow, both cattle and sheep can range farther out on the arid plains relying upon the browse-feed which often grows vigorously beyond living water. Cattle generally seek such winter pasture without driving. Other seasons which bring a limited amount of snow oblige stock to resort to their accustomed drinking places in the watered valleys. The quality of the indigenous plants and shrubs, which especially on the lowlands are impregnated with salt or alkali, necessitates a more frequent recourse of stock to water than is noticeable in the northern districts.

The practice of moving herds each spring from the lowlands into the mountains and uplands is general, and is easily effected. Along the Carson and the Truckee rivers and the Humboldt and its southern tributaries there are many limited stretches of heavily grassed bottom-lands, which offer fine grazing, mostly as inclosed or guarded pastures, and are capable of sustaining a numerous stock on a comparatively small area.

The following is an outline of an investment in Humboldt county:

2,000 three-year-old cows, native, at $12 50	$25,000
100 two-year-old grade shorthorn bulls, at $50	5,000
25 saddle horses, at $50	1,250
2 work horses, at $100	200
1 wagon and harness	150
Ranch, buildings, corrals, mower, saddles, etc	2,000
Total investment	33,600

The basis of expenses is indicated by the following outlay in the first year:

5 vaqueros, at $40 per month, eight months	$1,600 00
1 cook, at $30 per month, twelve months	360 00
2 vaqueros, at $40 per month, four months	320 00
Provisions for six men eight months and three men four months, at $12 a month	720 00
Taxes on cattle	450 00
Taxes on horses	30 37
Taxes on ranch and improvements	26 87
Total	3,507 24

Some have made great profits when all circumstances were favorable, and exceedingly dry summers and severe winters have been among the causes for exceptionally severe losses to others.

SOUTHERN NEVADA.

This is a region particularly noticeable for its vast amount of desert and barren land. The portions adapted to grazing and occupied by stock lie almost wholly north of latitude 38°, in Lincoln, Nye, Esmeralda, and Douglas counties. South of this parallel, except in isolated localities, of which Fish Lake valley, Lida valley, and Meadow valley are the most noticeable, no cattle or sheep were found grazing in 1880, nor was any unoccupied portion of this wide section believed to be capable of supporting any domestic stock throughout the year. The absence of permanent water on the Ralston desert, the Amargosa desert, and the parched valley of western Lincoln county and eastern Esmeralda, render the occasional tracts of pasturage unavailable during most of the year. In 1879 a drive of 18,000 sheep *en route* from Kern county, California, to Cheyenne, Wyoming, was taken by experienced shepherds, during the month of May, from Lida valley across the western portion of the Ralston desert to Hot Creek valley. The sheep were moved as rapidly as possible, but finding less water in pools than was expected 8,000 perished in five days from thirst. Occasional springs, insufficient for the sheep, relieved the distress of the drivers. Thousands of both cattle and sheep leaving California have passed over this trail. Except under favorable circumstances, however, the route is dangerous. During the winter season the skirts of such deserts nourish scattered bunch, sand, and gietta grasses, with stunted white sage sufficient for the maintenance of some stock, but they lack water. The pasture facilities of Nevada have been thoroughly tested, and we may rightly conclude that, generally, land which is not occupied at present, either by farmers or by stockmen, has been found unavailable or its pastures have been exhausted. Overstocking is universal in southern Nevada even where water is available. On the west Fish Lake valley and Lida valley each held in 1880 a herd of cattle during the winter, but as the water supply and feed failed on these ranges in summer the stock was moved into the mountains of Mono and Inyo counties, California. Permanent settlement by a few small farmers has taken place in both valleys, using fencing and irrigation to the extent of the water supply. In the upper portions of Esmeralda county heavy grazing by local cattle, assisted annually, previous to 1878, by flocks of California sheep, has injured the native grasses and white sage. The eastern portion of southern Nevada south of the 38th parallel is generally unavailable for free ranging. In the Pahranagat valley, Meadow valley, and along the Muddy and the Rio Virgin, cattle have for many years been ranged to the full capacity of the country, which has never been great, excepting in the case of Meadow valley and the valleys of Lincoln county north of the 38th parallel. The returns of stock for taxation show (with a proper allowance for untaxed animals) that less than 6,000 cattle and less than 2,500 sheep were owned in the entire county in 1880, a number which in the spring of that year was reduced considerably by drives to eastern markets.

North of the 38th parallel the principal stock occupation was in a portion of the valleys in winter and on the hills in summer. In northern Esmeralda county and in southern Douglas county the stock business was found to have declined in importance, and to have gradually fallen into the hands of a few cattlemen with extensive fenced-land claims. In Smith, Mason, and Antelope valleys, beef-cattle are fed for market in the fall and spring on hay. This is cut in great abundance on many of the extensive hay bottoms of east and west Walker rivers. Throughout this part of Nevada complaint of the impaired condition of the stock feed was universal, and it was stated that over-grazing and former inroads of California sheep had nearly destroyed large areas of sand-grass and white sage. In Nye county, north of the 38th parallel, is a number of large and tolerably well watered valleys, which were stocked mostly between 1860 and 1870, and are now badly overstocked, and the pasture is correspondingly exhausted.

The mortality among cattle and sheep incident to the unusual winter of 1879–'80 which followed a very dry summer was heavy in southern Nevada, especially in Ione and Reese river valleys. From careful investigation at the principal ranches of Reese river valley the average loss among cattle was estimated to be 50 per cent. and among sheep 33 per cent. in both valleys mentioned. There was an anxiety to remove the remaining cattle. "The calf-branding of the spring was hardly worth rodeoing the cattle for," as the cattlemen of the valley expressed it. One owner of 400 head of cattle, mostly cows, on the range in September, 1879, branded in 1880 only 35 calves; another but 28 calves from a herd of 600 stock cattle. In Nye county between 1860 and 1870, at the period of the

settling up of the valley sections by cattle and sheep raisers, the indigenous grasses and the winter browse-feed were comparatively luxuriant. At that time excellent beef was fattened and the herds did well; but when stock began to crowd the pastures the bunch-grasses, sand, rye, and wheat grasses, never able to resist close feeding by cattle and sheep, gradually failed. In many localities where the stocking was so heavy as to prevent the grass seed from maturing the grasses became wholly extinct. The white sage, greasewood, and other shrubs of value to a winter range were seriously injured, the white sage disappeared from wide areas, and the drought of 1877 to 1879 and the bad winter of 1879–'80 completed the disaster.

Barbed-wire fencing is becoming common in the valleys of Nye and Esmeralda counties for the purpose of inclosing areas of bottom-land in private ownership. Such inclosures and preserved pastures will sustain limited herds through the winter with occasional feeding.

FATTENING CATTLE ON HAY.—The feeding, or, in local language, the "putting up" of beef-cattle on hay during the late fall and winter, has for a number of years received considerable attention. In the Truckee meadows in 1879–'80 about a dozen stockmen marketed in the aggregate upward of 4,500 head of fat cattle, no one of them handling over 1,100. Owing to the high price of hay and the unusual severity of the winter, the profits were small.

One feeding ranch, selected for illustration of hay feeding, comprised in 1880 over 7,000 acres of fenced hay land and pasture, and some 10,000 acres more adjacent to the Walker river under process of fencing. The portion located in Antelope valley was available for irrigation. Large bodies of the low lands contiguous to the river are periodically overflowed and yield heavy crops of blue-joint, wire-grass, red-top and clover hay, some 3,000 tons having been cut in 1879. By dams of stone and brush the waters of Walker river have been directed through irrigating ditches. A canal 12 miles in length and having the capacity of 30,000 miners' inches had just been completed for converting 10,000 acres of sage-land into pasture. By flooding liberally the heavy black sage is killed, and it is followed the next season by grasses. No cattle are bred on this ranch, but merely fattened and marketed the same year. The animals, which are all grades, are raised on open ranges from several large herds owned by the firm both in Humboldt and in Douglas counties. Beside the land owned in Antelope valley a series of mountain valleys (called parks), situated at different altitudes on the east slope of the Sierra Nevada, in Alpine county, California, are also used during summer, the lowest being occupied first, as the snow leaves the lower slopes of the mountains in May or late April. Every spring when the stock cattle which have been wintered on the open ranges are in condition to be moved, the best animals of all classes over one year old are brought to the neighborhood of the Antelope valley ranch, a drive that occupies several weeks when from Humboldt county. After being classed according to age, size, and quality, they are taken in separate herds to the different mountain parks referred to and grazed until ready to market. Many fattened animals are disposed of by summer sales, when other drives brought from the supply herds are driven into the "parks" and take their places. At the close of the season the cattle are driven into the pastures of the feed ranch. These wide inclosures furnish heavy feed both on areas which have been cut over and on ground untouched by the mower. Selections of fat animals for the mining camps are constantly made. If a band of cattle or even an individual animal grazing in the fields shows signs of falling off in flesh, a transfer is made from the pasture to the feed pen, while all the stock intended for winter market is removed from the pastures as soon as the heavy frosts of late autumn have injured the quality of the low-land grasses. Wild-grass hay is esteemed better feed than that from domestic grasses. The best varieties of wild grass are blue-joint and wire-grass, though wild clover and red-top constitute a considerable proportion of the crop. A stream fed by a warm spring flows through the feed-pens and furnishes the stock with water of a mild temperature. The hay is fed from boxes placed on the ground and not in raised racks. It is claimed that in this way the hay is not impregnated with the moist breath of a bullock, rising through it and condensing on it as he feeds, making it offensive, preventing the animal from eating heartily. It is found that an average three-and-a-half-year-old Nevada steer consumes about 35 pounds of wild hay per diem while fattening. The class of beef cattle thus prepared averages 575 pounds dressed weight at three years old, and about 650 pounds when four years old, and well-fattened cows about 525 pounds. Many lots of old beeves are marketed which exceed the above estimates, particularly bullocks brought from northern Nevada and southern Oregon. Such cattle frequently weigh 700 to 750 pounds dressed, and exceptional animals attain much heavier weight. In the allotment of animals to the different yards, the greatest endeavor is made to class together bullocks of the same size and disposition. The period during which cattle are handled varies from one month to five months according to the condition of the animals and the state of the market. Pastures for holding the animals at night, situated at convenient distances on the main routes to the principal towns where fat beeves are sold, are owned or leased, and are sometimes used for grazing beeves temporarily, in anticipation of a demand from the neighboring slaughterers.

The estimated average value of Nevada cattle on the range during 1880 was as follows: Grade bulls, $42; ungraded, $25; cows, $12; three-year-old steers, $18; two-year-old, $11 50; yearlings, $7 50; calves, $5; beeves, $22.

PRICE OF STOCK CATTLE BY THE HERD IN ACTUAL SALES DURING 1880.

County.	Cattle.	Price per head.
Churchill	800	$12 50
Humboldt	1,100	18 60
Humboldt	9,000	12 50
Elko	1,000	14 00
Elko	2,000	13 00
Lander	1,200	11 50
Nye	2,100	11 00

The estimated average live weight of a three-and-a-half-year-old steer on the range in 1880 was 1,085 pounds; dressed weight, 565 pounds. Some estimates made by good authority placed the average weight of mature beeves somewhat higher, and rated the increased weight in this class of cattle since 1870 at 20 to 25 per cent.

The composition of nineteen herds of Nevada cattle, aggregating 94,796 head in 1879, was as follows: 1,422 bulls, or 1½ per cent. of the whole; 28,439 cows, or 30 per cent.; 11,861 three-year-old steers and beeves, or 12½ per cent.; 14,219 two-year-olds, or 15 per cent.; 19,907 yearlings, or 21 per cent.; 18,948 calves, or 20 per cent.

The estimated number of calves dropped to each 100 cows was 80; of these 66 survived to yearlings.

The estimated average annual loss among cattle over two months old for a term of years was 6 per cent., arising from the following causes: Disease, winter and spring storms, snake-bites, wild animals, theft, and poisonous weeds. The winter of 1879–'80 was the most severe since 1859–'60, and, according to the express testimony of over seventy cattlemen, the general average loss was 20 per cent.

SHEEP.

NOMADIC MANAGEMENT.—A wide difference exists in the practices of flock-masters in various parts of the state. On Quinn river, in Paradise valley and in Pleasant valley, as well as in other isolated instances, hay is put up and fenced pastures are used. The character of the grazing in Roop county and the necessity in most cases of resorting to the mountains during the summer, together with the infrequency of locations available for establishing permanent camps, have combined in giving to sheep-raising there a nomadic character. The limited plant necessary to engage in the sheep business, and the brief season which intervenes before an income from wool and increase may be derived, cause many to engage in it unprepared to sustain reverses. Although for several years the climate may prove favorable to the nomadic flock-owner, a season of unusual severity may come, finding him wholly unprepared to feed his sheep, and often annihilating the profits of previous years, as in the winter of 1879–'80.

An individual nomadic flockmaster, without title to any land, in the year 1876 purchased in Nye county 1,500 coarse-wooled (cotswold) sheep, originally from Calaveras county, California. Following the course of the Reese river and the Humboldt, he entered Washoe county with 1,000 ewes, the wethers having been sold along the route, and, selecting a tract of country adjacent to the so-called Yankee reservation, established a winter grazing ground some 24 miles square, without, however, attempting to gain any permanent title. As his intention was to grow wool chiefly, Spanish merinos of a fair grade were substituted for the grade of cotswold rams brought with the flock. After experiencing a loss of 18 per cent. during the winter of 1879–'80, and a heavy mortality among spring lambs, the flock was composed as follows, in May, 1880: 16 rams, valued at $7 to $15 each (12 lost during the winter); 1,200 adult ewes, at $2 each; 500 yearlings, at $2 each; 700 lambs, at $1 50 each; and 200 old wethers, at $2 25 each; a total of 2,616 sheep, with an aggregate value of a little over $5,000. Beginning with the flock in its winter quarters in October, we may outline its management for a year. About the middle of November the rams, which have been grazed with the wether flock of some other large owner, are admitted to the flock and allowed to remain until shearing-time in the following spring. During the summer they are again removed from the ewes. A single shepherd accompanies the flock; two pack-horses, which are picketed or grazed near the temporary camp, carry the scanty camp equipments of the shepherd and a fortnight's provision. Two dogs of a nondescript breed common in Nevada, and called "shepherd", are used in directing the movements of the flock and in guarding against coyotes or wild-cats, which are sometimes troublesome. At sunset the flock is brought slowly up to the camping place, usually near some small spring answering the purpose of the herder and of his horses and dogs. If the weather is clear, the sheep are merely rounded up or congregated on a level stretch of ground by the dogs. The shepherd sleeps by the flock. Aroused by the continual barking of the watchful dogs, he may find the flock scattered by the approach of a coyote; or, chilled by a sudden storm of drifting snow, they may have moved in a mass. Nothing can be done without corrals in a storm to hold the stock, which otherwise will drift until a lull occurs or a lea is reached behind some elevated ground. The occurrence of a gulch or a dry bed of a stream may expose the stock to heavy losses by suffocation, as they crowd blindly into it in their efforts to escape the cold. Violent storms are not so common in Nevada as on the plains, but sometimes result in great loss. Sometimes a sage-brush corral is constructed, and used if accessible; but unless the flock chances to be grazing in the near vicinity, or directly to windward of this inclosure, it is difficult to get them into it. In fine weather the shepherd, rising at dawn, gets his hasty meal, leaving the sheep to the care of the dogs. He shifts his quarters

so as to give his flock and pack-animals new grazing ground every week or ten days. Once in two or three weeks the owner comes with wagon and pack-animals to bring supplies and observe the condition of the flock. Thus the winter passes and lambing approaches. The flock, moved from the winter range to some more convenient level country, is guarded more carefully than usual, the herder being assisted by the owner. The lambing season generally occupies a month, and before it closes the shearing begins, when successive portions of the dry stock (*i. e.*, wethers and yearlings not breeding) are retained in the brush corral used at night during lambing, where they are sheared. After these, the ewes with lambs are sheared, the lambs being old enough to risk a temporary separation from their mothers. The whole flock, if badly afflicted with scab, is driven to the dipping troughs of some located sheepman and treated, the owner of the sheep paying for the privilege. Generally, however, the flock is allowed to go without dipping, and, as a check to the progress of the disease, a compound of grease and mercurial ointment is rubbed on the parts most visibly affected. About the last of May the flock without the rams moves slowly toward the summer ranges. With the exception of the rams removed during shearing, the different classes of sheep remain together all summer. A second shearing occurs in the fall, usually about the 25th of September, at which time the spring lambs are sometimes sheared as well as the adult stock. Late in September frosts and early storms compel the herder to drop down to the foot-hills, and finally, in October, to return to the winter pastures. The spring shear was very light in 1880, as the stock was exhausted by the severe winter, but the market price was higher than for several years.

SEMI-NOMADIC MANAGEMENT.—We will follow the management of an establishment where there is title to some land on one of the small eastern tributaries of Quinn river. A flock was driven from California by the Truckee river trail across the Sierras, then up the Humboldt to Winnemucca, where they left the river and, proceeding northward, were ranged to the number of 4,000 on new pastures. These sheep were graded merinos, and had been bred up from Missouri sheep, rough framed, long-legged, and long-wooled animals, by crossing with Spanish and French merino rams in California. Cotswold and southdown rams had also been used. At the time of the location on Quinn river the sheep yielded an average fleece of five pounds, showing strongly the qualities of various long-wooled breeds in their composition. This kind of sheep, because of its open fleece, was considered unsuited to the climate, and the long wool was liable to be torn off on the shrubs of the valley. From this time only Spanish merino rams were used, changed every three years, until, in 1880, there was not a sheep having less than three-fourths Spanish merino blood, while many of the increase of the last two years are seven-eighths Spanish merino. The first few years on Quinn river the flocks wintered without serious loss. No hay was put up nor were any pastures fenced for the use of lambs or weak sheep until after the winter of 1874–'75, which destroyed 40 per cent. of all the sheep held in that region. The next summer 350 tons of hay were stacked; in 1877 a further supply of hay and fine pasture was secured by fencing.

There were in 1880 about 5,000 acres of meadow and grass land under fence, the larger portion lying contiguous to Quinn river. This area, purchased from the state, had been gradually inclosed by pole and wire fencing, the latter article with posts of California redwood, costing nearly $400 per mile, but warranted to last ten or twelve years even in the Nevada climate. The practice of changing the grazing grounds with the seasons makes an estimate of the stock range controlled by the ranch very difficult, but as the flocks graze during the year over a country about 25 miles long by 15 wide the amount of government land accessible but not used by the sheep alone may be roughly placed at 240,000 acres, including both summer and winter ranges. A number of serviceable buildings and corrals necessary to the shearing and dipping season constitute, with the comfortable dwelling-house, the improvements at the home ranch, whither the flocks are driven when it becomes necessary to handle them for any special purpose. The total number of sheep owned at my visit was 12,400. A loss of 10 per cent. had been experienced the previous winter, while the spring dropping of lambs reached only 50 per cent. of the breeding ewes. Seven men are employed throughout the year, assisted at lambing time by three or four extra helpers and at shearing by twelve additional hands. The flock-owner directs the business personally, and employs as herders selected men at wages above the average. Herders receive $40 per month and helpers the same, their board costing $12 50 per month additional; the shearers are paid 7½ cents per fleece and board. In the general conduct of this business the sheep are ranged in different localities in flocks of from 1,200 to 2,500 head, each under the charge of one shepherd, who follows on foot and changes his camp about once in ten days, assisted by the proprietor, who visits him with fresh supplies at the end of that period. During summer no shelter for the men is needed, but in the cold season tents are provided, and on some of the ranges cabins are erected. The composition of the flock was 100 rams, 5,500 breeding and yearling ewes, 4,500 wethers, and 2,300 lambs; a total of 12,400. About the 1st of October the rams are taken from one of the wether bands with which they have been herded during the summer and are prepared for the breeding season by better pasturing and feeding of hay; one ram is allowed to 40 ewes during the season, which begins about the 20th of November. At this time the ewes, separated into three bands, are brought to the neighborhood of the home ranch and corralled at sundown. The rams are with them at night, but are removed each morning and fed hay, when the ewes go out for the day on the range. For the first ten days only a portion of the rams are admitted to the different flocks, at the end of that time more rams are put in, and finally, at the end of twenty days, the remainder are introduced. This practice prevents much unnecessary service and fighting. On the 1st of January the rams are separated and fed some hay until grass grows in the spring; each ram has 3 to 5 pounds of hay daily beside pasture. These rams are found most sure at two to five years old, though

they breed up to eight or nine years. While good weather lasts the adult sheep, divided into five flocks, are herded in various parts of the valley, ranging each day along the upper slopes and foot-hills or over the sage flats or unfenced bottom-lands of the lower country adjacent to the river.

In bad weather the sheep are corralled at night in sage-brush or stockade pens, but never unless the storm is severe, as the proprietor believes it injurious to the health of sheep ranged in large flocks, and that a moderate loss by exposure is preferable to the damage to the flock by corralling, which develops disease. Some wethers in the flocks on the Quinn river ranch have never been penned except to shear or to dip. When the seasons prove very inclement the flocks are moved into the inclosed pastures. Within these inclosures 500 tons of hay were cut in 1880. For nearly six months in 1879–'80 the lamb flock, accompanied by the shepherd, was grazed inside one of these fields, and each day fed about 1¾ pounds of hay to the head, an allowance required beyond the usual time by the harshness of the winter. During the same season all the stock required extra feed. Lambing is desirable not earlier than between the 10th and the 20th of April, as the danger from late storms is then avoided. The lambing season is usually over by the last of May. The ewe flocks, divided as in the breeding season, are again brought near the home ranch. Among highly graded sheep the maternal instincts are less active than in those of Mexican blood; many do not recognize their young. Among the graded merinos about 100 per cent. of lambs to the breeding ewes are dropped, of which 70 to 75 per cent. ordinarily survive weaning, though in favorable seasons 80 per cent. are raised. In 1880 only 50 per cent. of lambs lived to the winter. The ewes breed regularly up to seven or eight years when well cared for, after which it is best to dispose of them. Wethers, which shear heavily as a general thing, can be held with some profit until old age and exposure kills them. Lambs are castrated when two weeks old, as at that age they are considered less liable to loss by the operation. Attending to this at about the middle and again at the end of the lambing season, no lambs are lost. The tails are docked from all lambs and the private ear-mark is made at the time of castrating. Just after lambing, if the season be an early one, or during the last week in May, the wether flock is driven to the home ranch for shearing. Having clipped these flocks, the rams and yearlings are next sheared, the ewes with lambs being handled last. A good shearer will shear 65 to 70 animals in a day, but the average when handling grade Spanish merinos is not over 55 or 60, though with long-wooled cotswold or coarse-wooled Mexicans 100 are often sheared. The proprietor stated that an employé, on a wager, sheared 160 cotswold ewes in a single working day. After the shearing has been accomplished, and the fleeces rolled, weighed, and stored, the sheep are dipped. This proprietor uses a compound of sulphur and lime dissolved in water in the following proportions: Sulphur, 10 pounds; lime, 20 pounds; water, 60 gallons; the mixture frequently stirred and used at 120° F., as the lowest temperature, but best at 125° to 130° F., which latter heat is as high as is safe for the animals. With the conveniences at hand, about 3,000 sheep are dipped in a day, the expense amounting to not over $200, exclusive of the cost of regular labor. After this the stock, divided into five or six flocks, proceed to the summer ranges, gradually ascending the Cottonwood mountains as the spring approaches. Ewes with lambs are herded in flocks of 1,500, while wethers to the number of 2,000 or 2,200 are ranged together. The rams accompany one of the latter flocks for four months during the mild season. Abundant small streams or springs render the majority of the hill districts accessible, and the stock thrives well on the upland shrubs and grasses. Early in October the approach of frosts or snow on the higher ranges compels retreat to the lower slopes and foot-hills, which are grazed over until further snows necessitate a resort to the valley levels. In October the lambs are separated from the ewes, and, as soon as snow appears, are moved into the inclosed pastures and fed with hay. In the middle of November, having been prepared by pasture and wild-grass hay, the rams are again admitted to the ewes, including the yearlings.

In western Nevada the practice of fall shearing is almost universal, but is not practiced by this owner. The winter is deemed too severe.

The chief aim on this ranch is wool-growing, the market for mutton being limited and uncertain, but mutton and stock sheep are sold as occasion arises.

Merino is deemed the best breed for the climate and the pasture of Nevada. The close fleece is a protection against the weather and liability to be pulled out by the thorny shrubs of the winter pastures. The merinos are easier managed in large flocks, and remain healthier under the conditions there found. Other breeds are said to diminish both in size of carcass and in yield of wool when kept under the open-range system described. Some flockmen consider a trace of cotswold and Leicester blood valuable in giving additional size to the animal. Thoroughbred merinos are considered less profitable than grades, seven-eighths blood being considered sufficient. The Spanish merino is preferred to the French. According to this owner, no man in a region like Quinn river, 75 miles from a supply depot, can afford to run a flock which yields under 6 pounds of wool to the head. The oftener sheep are changed from one grazing ground to another, and the less frequently they are corralled or bedded down on the same spot, the better do they retain health. They are eminently susceptible to disease when they are held in large flocks, necessary to open range systems, particularly if congregated too long in a locality infected with their droppings.

It is believed that sheep with scab will infect the ground if kept on it for a number of nights, and that the scab insect, or acarus, will survive for a whole summer, preserved on tufts of wool or other débris left during the frequent congregating of the flock. In one case the pen used for shearing a flock of scabby sheep in June remained untenanted until early in October. Then a number of rams, previously in perfect health, were corralled in it for

a few nights. The animals were frequently observed lying in a corner where short tufts of wool, the sweepings of the shearing-house, were scattered. Within a week they exhibited indications of scab, which in time developed to a malignant type, and necessitated their being dipped, although the season was too advanced to do so without danger. These sheep had not come in contact with any affected ones.

The peculiar condition of freighting wool in Nevada, and the rules of the railroad company under which it is carried, materially modify the results of wool-growing in this state.

As regards weight of fleeces of the different sexes and classes the following figures have been given: Rams, 13 pounds; wethers, 7¾ pounds; ewes 6½ pounds; yearlings, 5¼ pounds, sheared only once a year. Many fleeces reach 18 pounds each, while selected bands of wethers shear an average upward of 8½ and even 9 pounds. The wool, after being sorted and weighed, is compressed on the ranch, with a patent machine, into 300-pound bales. Not more than half a dozen other flock-owners in the state have this scale and character of management. Winnemucca is the station from which all shipments are forwarded, and is also the base of supplies, several heavy wagons and a dozen draft and saddle horses furnishing transportation. In the haying season many Piute Indians are employed. Three mowing-machines, two horse-rakes, and a stout derrick are used. About 520 acres of land were cut over in 1880, yielding 500 tons of hay, which, secured on this scale, costs $2 75 or $3 per ton, and is worth at current prices by the rick $8 to $15 per ton, according to the season.

The estimated average value of sheep during 1880 in Nevada was as follows: Rams, $20; ewes, $2 25; wethers, $2 50; lambs, $1 75.

The estimated average live weight of mutton-sheep was 100 pounds; dressed weight, 50 pounds.

The estimated average wool-clip per head was: Rams, 12 pounds; ewes, 5¼ pounds; wethers, 6½ pounds; and lambs, 4½ pounds. The hard winter of 1879–'80 was unfavorable to a heavy shear in the spring.

ACTUAL LOSSES AMONG SHEEP IN NEVADA DURING THE WINTER OF 1879–'80.

[From statements of flockmasters.]

Location of sheep range.	Sheep owned at beginning of winter.	Sheep lost during winter and spring.	Percentage of loss.
Total	93,200	19,850	21
Washoe and Roop counties	2,000	1,200	60
Washoe and Roop counties	3,500	1,100	31
Washoe and Roop counties	3,200	1,000	31
Washoe and Roop counties	8,000	2,300	27
Washoe and Roop counties	3,000	700	23
Washoe and Roop counties	1,500	300	20
Washoe and Roop counties	2,500	1,000	40
Washoe and Roop counties	6,000	1,500	25
Quinn river	12,500	1,000	8
Quinn river	11,000	1,000	9
Grass valley, Humboldt county	1,800	200	11
Pleasant valley, Humboldt county	5,000	1,000	20
Reese river valley	2,500	500	20
Reese river valley	6,000	2,000	33
Reese river valley	7,000	1,500	21
Reese river valley	5,000	1,150	23
Reese river valley	5,500	1,100	20
Grass valley, Lander county	7,200	1,300	18

The composition of certain flocks of Nevada sheep, aggregating, in 1880, 23,430 head, was as follows: 180 rams, or nearly 1 per cent. of the whole; 11,000 ewes, or 47 per cent.; 7,700 wethers, or 33 per cent.; 4,550 lambs, or 19 per cent.

The estimated number of lambs dropped to each 100 adult ewes was 78; of these 41 per cent. survived to yearlings. Average percentage of loss during 1880 was 21 per cent.

The average percentage of annual loss for a term of years among sheep is estimated at 10 per cent.; disease, 3 per cent.; winter and spring storms, 4½ per cent.; wild animals, 1½ per cent.; poisonous weeds, 1 per cent.

KNOWN RECEIPTS OF WOOL FROM NEVADA DURING 1879.

	Pounds.
Wool received at Reno for San Francisco	570,916
Wool received at Winnemucca for San Francisco	302,014
Wool received at Battle Mountain for San Francisco	380,000
Wool received at Palisade for San Francisco	120,000
Wool received at Elko for San Francisco	50,000
Wool received at Salt Lake City from White Pine and Lincoln counties, via desert freight-routes	65,000
Total	1,487,930

The total receipts at Reno, on the Central Pacific railroad, include a certain amount of wool from Lassen and Butte counties, California, and Lake county, Oregon. The wool received at Winnemucca also includes portions of the product of Baker and Grant counties, Oregon, and Owyhee county, Idaho territory. We may estimate the total receipts of wool from sources beyond the state at 200,000 pounds.

All shipments of Nevada wool are forwarded first to California before reaching their final market in the eastern wool depots.

GOATS.

Although the number in the state does not materially affect the aggregate food-supply, there are individual flocks of considerable size, and considerable interest attaches to the efforts made to raise these animals for meat and for their wool. A large flock in Nevada contains about 2,900 head, bred from common goats with Angora bucks brought from California.

The composition of the flock was about 1,800 ewes, valued at $2 25 per head; 600 wethers, $2 75 per head; 500 kids, $2 25 per head; 12 bucks, $16 50 per head.

SWINE.

The number of hogs kept in Nevada is very limited. In July, 1880, the total number was but 9,165, nearly half of which were in Elko and Churchill counties, in each of which is some farming. Not over half a dozen cases were noted where as many as 100 hogs were owned by one man. An attempt was made in Nye county to introduce improved breeds in 1879, planting alfalfa. A large acreage of artichoke was planted for the swine to run upon at the proper season, but the attempt was said to have resulted unfavorably. The conditions of the climate prevent the raising of large grain crops and other cheap food suitable for fattening hogs.

MOVEMENT OF LIVE-STOCK DURING 1880.

From Nevada.	Destination.	Cattle.	Sheep.	Swine.	To Nevada.	Source.	Cattle.	Sheep.	Swine.
Total		85,681	25,362	51	Total		17,570	27,357	5,380
By drive	California	8,000			By drive	Oregon	*12,000	5,000	
By drive	Wyoming	20,000	15,000		By drive	California		†16,000	
By drive	Montana		10,000		By drive	Idaho	*5,000		
By railroad	California	*51,513	362	51	By railroad	California	570	6,357	4,286
By railroad	Wyoming and Nebraska	6,168			By railroad	Iowa			1,100

*About 12,000 were beeves from southern Oregon and Idaho, driven to stations on the Central Pacific railroad in Nevada and shipped thence to California.
†10,000 of these sheep were California trail-sheep wintering in eastern Nevada.

CATTLE, SHEEP, AND SWINE IN NEVADA AS REPORTED FOR CERTAIN YEARS.

Year.	Authority.	Cattle.	Sheep.*	Swine.
1852	Captain A. A. Parker	80	12	20
1855	Old residents of Carson, Geneva, and Truckee Meadows	2,200	Not known	Not known.
1858		4,000	do	do
1859		10,000	3,000	do
1860	Eighth Census (on farms)	5,471	376	3,571
1868	Biennial report of the surveyor-general of Nevada	13,905	5,010	2,520
1870	Ninth Census (on farms)	31,516	11,018	3,295
1880	Tenth Census, (on farms)	172,221	133,695	9,080
1880	Tenth Census (on farms and estimated unenumerated ranch and range stock)	216,823	230,695	9,165

ESTIMATED CATTLE, SHEEP, AND SWINE IN NEVADA JULY 1, 1880.

Sections.	Sections defined.	Approximate total acreage of available pasturage.	Approximate acreage of stock occupation.		Stock.		
			Cattle.	Sheep.	Cattle.	Sheep.*	Swine.
Northern	North of Humboldt river, including the county of Roop and portions of Humboldt, Lander, Eureka, and Elko.	13,788,085	13,788,085	9,889,000	81,454	74,280	1,425
Central	South of Humboldt river to north boundary of Douglas, Esmeralda, Nye, and Lincoln.	16,287,781	16,287,781	14,115,000	92,263	119,626	4,609
Southern	Counties of Douglas, Esmeralda, Nye, and Lincoln	8,223,923	8,223,923	7,024,000	42,836	36,789	3,131
	Total available pasture	38,299,789					
	Approximate total acreage of stock occupation		38,299,789	31,028,000			
	Indian stock				330		
	Total cattle, sheep, and swine				216,823	230,695	9,165

*See note to Texas tables, p. 31.

Total land acreage of state 70,233,600
Total population 62,266

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of neat stock the unit of stock, and considering five sheep to equal one head of cattle in consumption of pasture, we have 262,962 units of stock occupying 38,299,789 acres, or 145.65 acres to the head.

UTAH TERRITORY.

HISTORY.

NEAT CATTLE.—Oregon immigrants or mountaineers are reported to have occasionally wintered a few oxen in Brown's Hole, Salt Lake basin, and Cache valley, and some were more permanently held at the trading stations as early as 1826 within the present limits of Utah. Late in the spring of 1847 the advance of the Mormons reached Salt Lake valley and brought among the oxen attached to their wagons a few milch cows, which had served in the yoke. Later, in the fall of the same year, some 700 wagons arrived, mostly drawn by cattle, each "string" containing a yoke or two of Illinois or Ohio cows.

A limited number of swine were transported with other effects in the wagons by this party, and the live-stock held to winter by the Mormons in 1847 is said to have numbered about 3,000 cattle and 50 swine, beside horses and mules. In 1848 a few flocks of long coarse-wooled Illinois sheep came with the Mormon immigrants of that year. In 1849 additional trains of Mormon immigrants brought with them many lots of cattle, sheep, and swine. The work-stock of the pioneer party is said to have survived the winter with only natural feed, coming out in improved condition in the spring. The country is described in a pamphlet of those times as "covered everywhere by the varieties of tall bunch-grass, on which cattle fattened readily". In the California mining excitement the Mormons obtained by purchase or in trade many hundreds of good stock animals from the impatient gold seekers. Animals that were foot-sore, exhausted, and poor, were exchanged for those which had been recruited by rest or raised in the territory, and this exchange continued to be a source of profit to the local cattlemen so long as the commerce of the plains was carried on by wagon-trains. The condition of the herds and flocks was greatly improved by this constant infusion of new blood, and an excellent quality of beef and mutton was matured. According to the Seventh Census the live-stock of Utah for 1850 numbered 12,616 cattle, 3,262 sheep, and 914 swine. The colonists during the first ten years of their residence located cattle in almost every favorable valley within the present Utah, west of the Wasatch mountains. In 1853 a drive of some 2,300 work-steers, described as fine, heavily fattened animals, was made to the Sacramento market, where they are said to have sold at $200 to $250 per yoke. From time to time, between 1853 and 1870, surplus beef or mutton was driven to California, and later to the mining districts of Nevada. Neat stock for breeding purposes was driven as early as 1859 into White Pine county, Nevada. The first seven years of stock-raising in Utah had mild winters. The winter of 1855–'56, following a summer of drought, when the crops and natural forage were further reduced by grasshoppers, occasioned a heavy loss among all kinds of stock, "materially lessening the food" of the settlers, as one account gives it, and causing actual distress in many communities. This severe check was felt for several years. Twice since, in 1864–'65, and in 1879–'80, the territory has been visited by a winter disastrous to range herds, though probably the experience of the first-mentioned season was the worst.

The first importations of Texas cattle occurred about 1861, followed a year or two later by drives from southern California, which continued at intervals until 1873.

At first the average neat stock of Utah was of fair quality, but during the decade between 1860 and 1870 a great deterioration seems to have occurred, due apparently to admixture with the Texas and California breeds and the decline in the quality of pasturage caused by the increased occupation. Between 1870 and 1873, Mr. William Jennings, of Salt Lake, brought from Canada 25 shorthorn cattle, all *Herd-Book* animals, and other persons became interested in the improvement of cattle. The cattle in northern Utah in 1880 may be called American or grade, and in southern Utah, where the use of good sires was less general, seven-eighths American. It is claimed by stockmen who have ranged cattle in the territory since its first occupation that the grass-fed beeves of the present day are generally inferior in condition to bullocks of the same breed and age in the early days of more luxuriant grazing, when good beef could be gathered from the ranges at any time of the year. From the first the territory may be said to have had more beef than it needed. Drives to California began in 1853. The Nevada mines, from 1860 to 1873, took a portion of this surplus. Occasional drives of neat stock, both as beef and as breeding herds, were made to Idaho, Montana, and Nevada. While the overland railroad was in process of construction during 1867–'69 a new opportunity was offered for disposing of fattened animals, and a few years after its completion the business sprang up of driving beef cattle to eastern stations and shipping over the Union Pacific railroad. Colorado began to receive a few breeding herds from Utah in 1873, a trade that increased largely until 1876, after which Wyoming took the largest number. The driving of neat stock chiefly to the Wyoming and the Chicago markets reached, according to the best testimony, more than 50,000 head in 1879, and 60,000 head in 1880.

It is believed that Utah in 1876 contained more cattle than at any other date before or since. At that time this industry had begun to give way to the advance of sheep husbandry, which in 1878–'79 completely took its place in several important valleys. Under the Mormon rule the conflicting interests of cattle and sheep seem to have been more easily and successfully adjusted than in any other regions. The natural adaptability of large areas

of browse-range to the use of sheep and their rapid multiplication have gradually crowded large cattle herds to other pastures. The exodus in 1879 was a direct consequence of the pressure of the one industry upon the other, while good prices at Cheyenne and at Laramie City gave direction to the outlet. After the terrible winter of 1879–'80 many stock-owners disposed of their cattle. Thus within a few seasons the cattle interests of Utah have materially declined. East of the Colorado and the Green rivers sheep had not as yet penetrated in June, 1880. Every accessible region adapted for holding domestic stock was then fully occupied. In the distant ranges of the Salt mountains (Sierra la Sal) and the Sierra Abajo, cattlemen, both Mormons and Colorado ranchmen, during 1878, finding this region well grassed and watered, concluded to risk their stock in the neighborhood of the Utes, and located several large breeding herds. This filled the only pasture grounds of importance in the territory hitherto unoccupied.

SHEEP.—In addition to the incidental mention of sheep in the preceding paragraphs, it may be stated that in 1848, among Ohio and Illinois natives, the first sheep brought in, there were some good graded, long-wooled cotswold rams. In 1852 nine thoroughbred Saxon rams and several grade cotswolds were brought in. In 1849 a carding-machine was introduced, succeeded by others brought from the east and also built at Salt Lake, the rolls being spun on the old-fashioned spinning-wheel.

Two flocks of New Mexican sheep, 5,000 in number, driven by Tim Goodle and Kit Carson, the well-known mountaineers, and destined for the Sacramento market, wintered on Green river in 1852–'53. Several hundred of this inferior breed were purchased by the Mormons. In 1853 a Missourian named Skaggs started from the states for the Pacific coast with 10,000 native sheep intended for the mining markets. While crossing the north Platte river a flock of 900 sheep refused to leave an island in the stream and were abandoned. They were afterwards gotten off by a Mormon emigrant party, which brought them to Salt Lake, together with others that had lagged from the trail.

Mr. Daniel Davidson, at present a prominent flockmaster in Utah, who passed through Salt Lake city in 1854 *en route* for California, described the stock owned by the settlers as "very fair native (states) sheep, having a grade of the Saxon and cotswold in them, though there was also a considerable number of the pure Mexicans". Many small lots of foot-sore sheep, with occasional cotswold rams, were obtained from the California-bound wagon-trains. In this way two merino rams are said to have been obtained in 1858. At intervals from 1859 to 1865 the excess of mutton-sheep was disposed of by driving to the mining districts of California and Nevada. Owing to the large importations of New Mexico and coarse Missouri sheep at intervals between 1858 and 1865 the quality of Utah flocks was lowered. In 1866, upon the establishment of a woolen-mill in Utah, there was demand for finer wool than had been produced. Henry Bell traded to Brigham Young, in exchange for fat wethers, 5,000 grafted merinos from California, derived from Mexican ewes bred to fine-wooled rams. After the war of the rebellion the high prices of wool stimulated a demand for stock sheep, which was supplied between 1869 and 1876 from California and Nevada. The majority of these flocks were more or less improved by the use of merino rams. In 1869 Christensen brought in some cotswold and southdowns, succeeded by others; yet up to 1871 only three well-graded flocks were owned in the territory, and these were of the cotswolds, merino rams having been as yet used in only a few flocks. Previous to 1873 the Wasatch and the Deseret mills and other home demands consumed all the fine wool produced. The amount was insignificant: not over 80,000 pounds for machine manufacture in 1872, according to Mr. James Dunn, while the total wool clip of the territory was not over 400,000 pounds. In 1873 Mr. Davidson brought in 400 high-grade Spanish rams, an example followed by other stockmen, and resulting in a few years in the presence of a large number of merino rams from Vermont, Kentucky, and California, of both the Spanish and French strains.

After 1876 only limited foreign stocks entered the territory for permanent location. In that year and in 1875 the drives from California and from Nevada had been large, filling the ranges of the country to their full capacity. The chief aim of the sheep-owner was to produce wool. Old wethers were kept for their clip until age or a severe winter killed them. There was an oversupply for home consumption, and railroad transportation was costly. Trail drives to the Wyoming and Nebraska markets were made from time to time, taking in 1880 over 20,000 head of sheep. As an indication of the increase in production and change in character, the popular commercial estimates credit Utah in 1873 with 580,000 pounds of wool, of which that classed as fine was scarcely an item, and in 1879 the commercial estimates placed the wool clip at 2,000,000 pounds, classing the product as medium to fine, an increase in six years of 344 per cent. in quantity with a great improvement in grade. A serious check was given to sheep-growing in the winter of 1879–'80, the severest since 1855–'56.

NORTHERN AND WESTERN UTAH.

Almost the entire area of the territory west of the Green and the Colorado rivers relies upon the Wasatch mountains as a summer pasture ground. When autumn frosts first strike the higher pastures the shepherds come down with their sheep to the lower slopes and foot-hills, and thence to the valleys, moving slowly toward the "browse-lands" of the western deserts, or perchance lingering on favorable ground found *en route*. There the stormy months are passed, changing camp frequently, after the nomadic fashion of the country. Cattle are no less dependent

upon a change from valley to upland, though their ranges for the two seasons are less widely separated than in the case of sheep. On the east side of the Wasatch mountains, in the great depression known as Castle valley, the same semi-annual removal to fresh pasture grounds is effected as on the western side, though on a much smaller scale. The occupation of the same locality by cattle or sheep during the entire year is rare, and few permanent stock ranches are therefore located within the territory, temporary camps being built, or, as is more general, wagons or cabins on wheels being employed for the use of herders. When the no-fence statute became a law, holding the cattle-raiser responsible for the damages inflicted by his cattle on the unfenced lands of farmers, some of whom planted inferior ground for the purpose of annoying their neighbors by impounding animals that trespassed on their lands, it greatly benefited bona-fide settlers who wished to grow crops but could not afford to fence. It compelled stockmen then to hold their herds away from the neighborhood of the agricultural settlements. New locations within the territory were difficult to find. The once best-grassed and most valuable pasture grounds of the territory present now scarcely a trace of their former abundant forage grasses or browse-feed, and nothing but a constant change of locality makes them serviceable even to sheep. The desert browse-lands for the one season and the Wasatch elevated pastures for the other are more appreciated since the decadence of the stock capacities of the intervening valleys. In 1880 there was not a single locality west of the Wasatch mountains from Cache valley to the basin of the Rio Virgin which did not exhibit effects of overstocking. The close feeding has greatly increased the mortality in severe winters. For example, in the winter of 1879–'80, 625 head of dry cattle belonging to the townspeople of Tooele City were given in charge of two herders, to be loose-herded in Skull valley, after the custom of Mormon settlements, with dry cattle from their milch herds. These cattle occupied a range eight or ten miles square formerly well grassed, but then badly pastured down by sheep. The cowmen in charge, according to the terms of their herd-contract, though not responsible for the death of a cow, were to produce the hide or give good evidence of the natural death of all animals in their charge. After the deep snows and harsh weather of that winter only six head out of the whole were brought back to the settlement. This statement was obtained direct from one of the herders. The foreman of a stock-herd ranging in Tintic valley, and said to number 5,000 head, stated that a contract to deliver 1,200 head in the following spring could not be filled, as not enough surviving cattle could be rounded up to tally out that number. The following estimates of sheep losses are tabulated to illustrate the severity of that winter and the influence of exceptional years upon live-stock interests. They are compiled from personal statements of flock-masters:

REPORTED LOSSES AMONG SHEEP IN UTAH IN THE WINTER OF 1879–'80.

Location.	Owned at beginning of winter.	Lost during the winter.	Percentage of loss.
Total	41,100	17,850	43
Tooele county	1,600	400	25
Tooele county	3,200	1,500	47
Tooele county	1,800	1,000	56
Tooele county	8,500	4,000	47
Tooele county	1,400	1,100	79
Tooele county	2,500	300	12
Tooele county	3,500	1,200	34
Tooele county	5,000	2,000	40
Tooele county	1,700	1,100	65
Tooele county	1,500	1,000	67
Tooele county	3,000	2,100	70
Millard county	7,000	2,000	29
Juab county	400	150	38

On the western barrens unusual snow permits sheep and cattle to push farther out on the desert, subsisting on white sage and greasewood, while the snow serves for drink; but in the middle country between the Wasatch and the deserts such storms serve only to diminish the feed supply and bring disaster. While the present nomadic management of the business continues, which indeed seems more necessary in proportion as the pasturage deteriorates, sheep-growing will be hazardous. It would be difficult for a person who had never seen a locality of abundant bunch-grass but sparsely grazed, to credit the stories of the pioneer Mormons regarding the profuseness and strength of the varieties which in early days they declare covered to a height of from 14 to 20 inches every valley and mountain slope favorable to their growth. Work-cattle, worn out by the labors of the overland journey and turned loose to pass the winter as best they might, astonished their owners by rapidly improving in flesh, being in the spring "beef fat". No range of any extent could be found in Utah to-day west of the Green and Colorado rivers where animals could find bunch-grass plentiful enough to keep them in good order through the winter and spring months. On the least frequented browse-lands of the arid sections in the western countries mutton-sheep no doubt retain their fat through cold seasons; but in general it is said to be difficult to obtain good beef or mutton even among dry stock from February until May. The greater precipitations in the forms of rain and snow which occur throughout the Wasatch mountains conduce to the vigorous growth of many varieties of bunch-grass and

edible shrubs more succulent than the coarse and woody browse or dry lowland grasses. Many of the most accessible mountain pastures have been denuded to a great extent of their abundant pasturage. There are still ranges left, situated farther within the main chain, but of impaired quality, sufficient for the four or five months of grazing to which they are subjected. The mountain grass-lands seem capable of carrying more cattle and sheep during the summer than the lower country can maintain during the remainder of the year.

DAIRY SYSTEM.—Through the Salt Lake, Utah, and San Pete valleys, where irrigation is practiced, many areas of meadow land have been sown with tame grasses, among them timothy, red-top, blue-grass, and, more common than all and of vast importance to the dairy interests, the alfalfa or lucerne, introduced from California. Utah ranks low as a producer of hay, especially wild-grass hay, few varieties except wire-grass and water-grass being available for this purpose. Lucerne is widely used among the settlements for feeding dairy herds during severe weather, when the "town range" usually reserved for them becomes exhausted.

Under the dairy system of the Mormon communities the milch cattle of every Mormon hamlet are collected every morning by herders, who take them from the village and guard them on neighboring wild-grass lands, returning the herd at night, when each animal is driven to or seeks its own quarters, where usually, except in time of best natural feed, it is provided with fodder from the alfalfa patch or hay claim of its owner. The well-to-do villagers keep each one or more head of cows. From some of the settlements favorably situated as regards accessible pasturage the "town herd" forms an imposing drove, sometimes amounting to from 500 to 900 animals. The dry animals and yearling stock are usually held as a range herd in some distant locality until the cows are fit for dairy purposes, while the steers and barren cows are "turned off" for beef. Many stock herds in Utah are owned and handled under the co-operative plan. A skilled stockman is usually placed in charge, who is, perhaps, directly interested. As an example may be cited an extensive dairy of 600 milch cows about 12 miles from Brigham City. The months of May, June, July, and August constituted the dairy season. One-half of the herd was corralled and milked at a time, the cows being milked but once a day. The milk was all used in the production of butter and cheese, the slops being fed to some 300 hogs. An estimate by the manager, Bishop Nichols, placed the average yield of each cow at 80 pounds of cheese and 20 pounds of butter for the season of four months. The butter and cheese were all marketed at Salt Lake city and Ogden, while the fattened pork added to the revenues of the business.

UTAH SOUTH OF GREEN RIVER.

East of the Colorado and Green rivers, neat stock was confined to seven or eight pasture grounds detached and separated by bad lands and plateaus, or cañon lands limiting or precluding intercommunication. South of Grand river, between the Rio Colorado and the territorial limits east and south, only three districts were grazing cattle in June, 1880, and these comprised but a small proportion of the total area. On Montezuma creek a stock ranch had been located in 1878 with a herd of 700 cattle, the only attempt of the kind on the San Juan or its tributaries within Utah. West to its confluence with the Colorado the country is described as too dry and barren for habitation, being furrowed by cañons holding the only living water far below the reach of stock. The same rugged topography distinguishes the whole of the region northward along the course of the Rio Colorado until the vicinity of Pack creek (usually called Deep creek on maps) is reached, and eastward to the foot-hills of the Sierra Abajo and Sierra La Sal, where the conditions change and admit of cattle-raising. Even were it possible to penetrate with domestic animals into the interior of this cañon country, no sustenance for stock could be found on plateaus and hills. It was said that locations had already (1879) been made in the only available pasture lands of the southeast, *i. e.*, on Montezuma creek, and along the base of the Sierra Abajo and Sierra La Sal ranges.

The Montezuma creek stock-ground afforded limited pasturage at the head of the main stream and along a narrow valley extending to its junction with the San Juan. It was said to be fully stocked with its present occupants, some 1,200 head of neat stock.

North and a little west of Montezuma creek is the detached mountain spur of the Sierra Abajo, which was first approached for permanent residence in 1878 by four Colorado ranchmen, whose herds aggregated about 5,000 head in the spring of 1880. These venturesome owners established camps on three streams flowing east and southeast from the mountains, not placed on any map examined. Their stock range through the broken but well-grassed country skirting the main spur penetrated in summer to the very heart of the highlands and going out a distance of from 5 to 15 miles from the base of the Sierra Abajo. Pasturage is the usual bunch-grass, sand-grass, and circle-grass, with white sage in the lower foot-hills. During summer, when the elevated tracts are reached, cattle find vigorous bunch-grasses on the hill slopes and the mountain peaks.

Sierra La Sal.—Separated from the Sierra Abajo in part by the difficult passage of the cañon Colorado and in part by a bad-land country, too parched, at least in summer, for the safe transit of domestic animals, is the prominent mountain spur known as the Sierra La Sal. In 1878 about a dozen Mormon prospectors took up farming claims on Castle Mill and Salt creeks. They brought in during that and the following season upward of 5,000 cattle, of which 1,300 head were owned by two Mormon co-operative associations. The colonists were reported to be well satisfied with their location and the facilities offered by the country, both for limited farming and for stock-raising, their only serious annoyance resulting from occasional visits of Uncompahgre Utes begging supplies and killing the settlers' beef when game was not readily found. The pasture in the cold season extends, with excepted areas,

completely round the base of the Sierra La Sal, taking in a strip of irregular width and character, but generally supporting a vigorous growth of the indigenous grasses and white sage, besides affording frequent water and shelter from occasional storms. Within several miles of Grand river the prevalence of barren rock and cañon excludes all entrance. The herds range northeastward, reaching in winter the neighborhood of the Dolores fork; during the remainder of the year they seek the uplands and graze through the accessible portions of the mountains. As in the case of the Sierra Abajo, vegetation sufficient for the maintenance of domestic stock gradually disappears on the west and southwest from the foot-hills, although immediately toward the west the narrow bottom lands of the creeks already mentioned permit of agriculture on a small scale under irrigation. The winter of 1879–'80, so destructive elsewhere to the Utah stock, occasioned no unusual mortality among the herds. According to Mr. Bartlett, good beef was obtained during the winter, a test of pasturage which no range in Utah west of this region could have met successfully that season.

Between Grand and Green rivers a herd of 300 ill-conditioned cattle from Castle valley were turned loose to winter in the fall of 1879. It was estimated that 75 per cent. had perished from severe cold and starvation incident to heavy snows and short grass. About 12 miles northwest from the old Mormon fort on Grand river, and situated on the Spanish trail by which this part of Utah is reached, a cattle range was located in the spring of 1880, capable, it was said, of keeping 1,000 head of cattle. Three springs, the only permanent water in the section, had been secured by taking up contiguous land. The character of the herbage assured fair grazing, and the surface of the country for a space of 15 miles by 5 permitted easy ranging of stock.

Grand River valley.—The basin along the east side of Grand river specified on government maps as Grand river valley was reported by Bartlett, Black, and other stockmen who had prospected the country, as partly a slightly raised bench-land growing heavy sage-brush in an alluvial soil, apparently susceptible of being farmed by irrigation, though the labor and expense of ditching might preclude such an attempt. There is a tolerable growth of bunch-grass among the sage, at least during a portion of the year. Safe winter-quarters could hardly be found for stock within the Grand river valley, "it seemed about an even chance whether the first herd turned loose in the basin 'rustled' through the season or got 'froze out' by winter snows."

Willow creek.—Northward from the three Springs and the unpastured basin just described is a barren tract, until the neighborhood of Willow creek is reached, a stream 30 miles south from White river and not indicated on most maps. The Willow creek stock range covers a territory about 30 miles by 20 during the cold season, but is curtailed in summer. The stream in summer sinks after flowing a few miles, thus diminishing the drinking places. Fed by springs on the slope of the Roan or Book plateau, Willow creek was said by Major J. J. Critchton and Captain Egan, owners of herds ranged there, to reach the main stream only in the spring, when and during cold weather the outlying portions of the grassed lands could be reached. Three parties had held cattle in this locality since the summer of 1878, their possessions amounting in June, 1880, to 2,500 head, fully occupying the range, especially in hot weather. Animals rarely drifted from their few drinking places, and the limited number of bands represented on the range requires the services of but a small number of men.

THE UINTAH-WHITE BASIN.

The region on both sides of Green river, designated by Major Powell as the Uintah-White basin, supported in 1880 a number of permanent breeding herds, approximating 12,000 cattle. With the exception of the reservation for the Uintahs, which contains choice grass farming lands, the basin is well stocked on either side of Green river. The limits of this grazing country are the Uintah mountains on the north, the Uintah and Wasatch mountains on the west, the bad lands and cañon lands on the south, while on the east the opportunities for stock extend beyond the territorial border. East of Green river the course of White river marks practically the southern skirt of this available range. Estrays often cross the White and drift southward into the Willow creek range, as well as toward the east, having reached in several instances the White River Ute agency. The first ranchman bringing neat stock into this region was Captain Dodds, who established a camp lower down on Ashley's fork in 1874, having a herd of 400 Utah-bred cattle from the Bear river district. In 1876 and 1877 several larger herds were introduced, owned by Salt Lake herdsmen, notably those of Mr. M. Evans and Charles Popper, who built ranches on either side of Green river, just above its confluence with the White. This part of Utah is said to answer admirably for stock-raising, cattle requiring, however, to be kept outside the Uintah reservation. On the east side of Green river stray animals are likely to perish if allowed to drift too far into the barren districts south of White river. A change from winter to summer ground is imperative, as the valleys of the Green and the White rivers, as well as the bad lands, furnishing at times excellent winter feed, become too parched to admit of keeping herds between June and September. The practice among the half dozen ranches on the west side is to move their stock into the hills and broken country watered by the upper tributaries of Ashley's fork, where rich bunch-grass and ample drink fatten beeves readily. The eastern cattle are forced back from the forks of the Green and the Grand rivers in a northeasterly direction into the borders of Yamba plateau, and through the rough but well-grassed hills to the south. When fall approaches considerable rain falls over the whole basin. It is said that the surface of bad lands, after rains, produces a species of short, curly grass, growing in detached bunches, but abundant and much esteemed by cattle. Mr. Popper employs line-riders during the winter, who traverse the southern limits

of his range. Stockmen had previous to 1880 wintered their saddle-horses without hay, but usually using grain. Losses by theft and by wild animals are occasional. Conflicting reports were current at Salt Lake regarding the extent of the mortality occasioned by the winter of 1879–'80, which some placed at 15 per cent. in the ranges between the forks of the Du Chesne, Green, and White rivers. On Ashley's fork and Brush creek there was no feed above the snow for a period of five months, obliging the small herds held by farmers to resort to brush after their owners had fed out their hay. Supplies failed in that locality, the ranchmen being unable to cross the mountain toward the west until late in the spring. Further up on Green river, in an elevated valley known as Island park, there were three herds of cattle, aggregating 1,900 head, located for winter grazing in 1879–'80, the owner of each being unaware of the other's intention until reaching the rendezvous. Of these cattle 60 per cent. were reported dead in May, 1880, while the snow was still two feet deep on the level and the passes were blocked by drifts.

Brown's park.—In the extreme northeast, on Green river, partly in Utah and partly in Colorado, lies Brown's park, better known as Brown's hole. Here, it is stated, 4,000 trail cattle passed the season of 1879–'80, and experienced severe losses. It has long been known as a favorite winter quarters for mountaineers, and within the past half dozen seasons has been resorted to by trail-drivers belated on their route. The cattle have in moderate years endured the cold weather well. Throughout the Uintah-White basin, as elsewhere in Utah, the residents were unprepared for the rigor of the winter of 1879–'80. While certain elevated pastures like Island park and the valleys of Brush and Ashley's forks are certainly too hazardous for permanent occupation, the general opinion is that the Uintah-White basin is a safe locality during average years.

With the exception of a few small lots of mutton-sheep driven in by the Mormons engaged in farming on Ashley's fork, but which gave no serious annoyance to cattlemen, no attempts at wool-growing have been made. The beef-cattle turned off from northeastern Utah all go to the Wyoming market, where they are either used or held to graze for a season, or shipped at once as beef to Chicago, or to Iowa for feeding. About 5,000 cattle left the range in this way in 1879, among them 1,200 head of cows and heifers furnished on contract to the Rosebud and the Pine Ridge agencies, Dakota. The three or four large owners used graded shorthorn and Devon bulls. The lowlands are too limited in very severe or very dry winters to permit of increasing herds beyond the present stock. In 1880 there were 136.97 acres of grazing to each unit of stock held within the territory, which was then regarded as fully stocked.

No system of stock-gathering approaching in magnitude and importance the "round-ups" on the plains is here necessary, because of the circumscribed character of the stock-grounds and the limited size of the herds.

The black-leg was found to be attacking young cattle in the northwest of Utah, chiefly in Box Elder county. Stockmen stated that their herds had never, previous to 1879, been visited by that or any other fatal disease.

SOURCES OF LOSS AMONG SHEEP.—The migration of sheep flocks encourages the prevalence of scab. This disease was said by all flock-owners to exist almost universally throughout the territory. Previous to 1876 no Mormon sheepman practiced dipping his stock as an antidote to scab, but in 1879 many flock-owners dipped their sheep. "Handling" sheep for the disease was still extensively adhered to, which consisted in catching such sheep as were seen to be affected and rubbing grease mixed with mercurial preparations on the diseased parts. Close attention to the appearance of the disorder often kept it under control, never, however, fairly eradicating it. When flocks were intrusted to lazy, unreliable herders who failed to apply the ointment frequently, the progress of the disease during the long season of absence on the deserts was often rapid, and resulted in great mortality from weakening animals, thus causing them to succumb to storms, while the wool product of the surviving flock would be much reduced. The custom of driving thousands of sheep each spring to the neighborhood of the river Jordan for shearing, convenient to the Salt Lake market, has also tended to spread the contagion. Flockmasters assert that the bed-grounds of infected sheep are a sure medium for disseminating scab to a healthy flock which may later occupy the same spot. Each season between 100,000 and 200,000 sheep approach this common rendezvous in shearing time. Of other troubles occurring among sheep, blind staggers was stated to be most common and fatal, though no great mortality resulted from it. Losses by alkali taken in too large quantities with feed or drink while heated with traveling, and from bears, mountain lions, (*a*) coyotes, or wildcats on the upland summer feeding-grounds were occasional throughout the territory, and in some localities of more frequent recurrence. A flock-master of White river reported the loss of 32 valuable blooded rams in one night by a mountain lion that entered their pen. This same owner attributed a 5 per cent. loss each year to wild animals, an uncommon complaint, however, in most sections of Utah.

POISONOUS VEGETATION.—Among the plants eaten by cattle and sheep there are three which are commonly believed to be a source of slight annual loss among live-stock. The poisonous parsnip, growing in wet meadow lands, and fatal to cattle when its root is eaten, is indigenous to many localities, particularly in improved and irrigated pastures to which milch cows may have access. Another variety often fatal to young lambs is the poisonous sego found along water-courses on the valley slopes and bench lands; the leaves of this plant are said to cause the difficulty, as its bulb, though known to be injurious, is too firmly planted to be torn up by an animal while grazing. In Juab valley a larkspur (monk's-hood?) was said by cattle-owners to be a frequent cause of death, in wet springs, among neat stock. Other localities of the western slope of the Wasatch mountains were reported as nourishing this baneful growth, identical with the notorious "poison weed" of Colorado and Wyoming.

a Panthers are usually known, west of the Rocky mountains, as lions, mountain lions, or California lions.

Although thefts of cattle and sheep were rare on the majority of Utah pasture-grounds, the outlying desert border ranges were the scene of occasional serious depredations. Desperadoes would run a drove of cattle or of horses across the deserts to the west by forced drives and, resorting to some isolated locality, hold the stolen stock until, the immediate danger of pursuit being over, they could move it to some favorable mining market. "Fixing" brands, *i. e.*, changing the shape of the brand on a cow, so that it might be openly claimed on the range or sold with effrontery at the local markets, was another reported device of these cattle-thieves. The difficulty of following such trespassers over the barren wastes to which they resort, or of routing them from a country full of hardship to the pursuer, favors a few bold marauders familiar with desert trails and secret watering places.

From the statement of ranchmen and butchers the average weights in 1880 of grass-fed beeves, three and a half years old, from the Utah pastures, are estimated as follows: Native ungraded cattle, live weight, 1,055 pounds; dressed, 550 pounds; for cattle improved by use of graded bulls, live weight, 1,175 pounds; dressed, 615 pounds. There was a general belief that the average weight of the animals had increased 10 or 12 per cent. between 1870 and 1880, due to better breeding.

ESTIMATED AVERAGE VALUE OF UTAH CATTLE FOR 1879 AND 1880.

Years.	Locality.	Bulls.	Cows.	Beeves.	Three-year-old steers.	Two-year-old steers.	Two-year-old heifers.	Yearling steers.	Yearling heifers.	Calves.
1879	Southern Utah	$20 00	$11 00	$20 00	$16 00	$11 00	$10 50	$7 50	$6 00	$3 50
	Northern Utah	25 00	13 00	22 00	18 00	13 00	12 00	8 50	7 00	4 50
1880	Southern Utah	21 00	12 50	23 00	18 00	13 00	12 00	8 50	7 50	4 50
	Northern Utah	27 00	16 00	25 00	20 00	15 00	14 00	10 00	8 50	5 50

According to Special Abstract No. 9, Manufactures, Tenth Census, of 2,677 beeves slaughtered, valued at $56,185, the average live weight was 1,100 pounds; of 6,640 sheep slaughtered, valued at $16,600, the average live weight was 120 pounds; and of 350 hogs slaughtered, valued at $6,400, the average live weight was 360 pounds.

ESTIMATED MOVEMENT OF LIVE-STOCK FROM 1877 TO 1880.

FROM UTAH.					TO UTAH.				
Year.		Destination.	Cattle.	Sheep.	Year.		Source.	Cattle.	Sheep.
1877	By drives	To Wyoming, Colorado, and Nebraska.	23,500	.....	1878	By drives	Wintering in Box Elder county from Oregon trail.	3,000	.....
1877	By railroad	To Chicago	4,500	.....	1878	do	California	.....	10,000
1877	By drives	To Wyoming and Colorado	.....	15,000	1878	do	Wintering en route, Nevada to Colorado.	.....	5,000
		Total	28,000	15,000			Total	3,000	15,000
1878	By drives	To Wyoming, Colorado, and Nebraska.	35,000	.....	1879	do	Cattle wintering from western trail	2,500	.....
1878	By railroad	To Chicago	2,000	.....	1879	do	To remain from western trail	.....	8,000
1878	do	To Chicago (frozen meat), carcasses	100	.....	1879	do	Nevada sheep wintering en route to Colorado and Wyoming.	.....	15,000
1878	do	To San Francisco, in refrigerator cars (carcasses).	3,000	.....			Total	2,500	23,000
1878	By drives	To Wyoming and Colorado	.....	10,000					
1878	do	To Montana	.....	10,000					
		Total	40,100	20,000	1880	do	Cattle wintering from trail	1,200	.....
1879	do	To Wyoming, Nebraska, and southwestern Dakota.	47,000	.....	1880	do	Wintering en route from California to Cheyenne.	.....	15,000
1879	By railroad	To Chicago	3,500	1,200			Total	1,200	15,000
1879	do	To San Francisco, in refrigerator cars (carcasses).	1,000	.....			Grand total	6,700	53,000
1879	By drives	To Wyoming and Colorado	.....	15,000					
		Total	51,500	16,200					
1880	do	To Wyoming, Nebraska, and southwest Dakota.	53,000	.....					
1880	By railroad	To Chicago	2,300	.....					
1880	do	To San Francisco	231	.....					
1880	By drives	To Arizona	3,000	15,000					
1880	do	To Montana	900	5,000					
1880	do	To Wyoming	.....	20,000					
		Total	59,431	40,000					
		Grand total	179,031	91,200					

ESTIMATED NUMBER OF CATTLE, SHEEP, AND SWINE IN UTAH TERRITORY AS REPORTED FOR CERTAIN YEARS.

Year.	Authority.	Cattle.	Sheep.*	Swine.
1847	Mormon residents	†3,000	.....	50
1850	Seventh Census (on farms)	12,616	3,262	914
1860	Eighth Census (on farms)	34,094	37,332	6,767
1870	Ninth Census (on farms)	39,180	50,672	3,150
1875	Deseret Agricultural Society Report	174,076	303,228	26,540
1879	Returns for taxation	124,940	351,534	13,261
1880	Tenth Census (on farms)	95,416	233,121	17,196
1880	Tenth Census (on farms and estimated unenumerated ranch and range stock)	132,655	523,121	20,621

ESTIMATED NUMBER OF CATTLE, SHEEP, AND SWINE IN UTAH TERRITORY JULY 1, 1880.

Sections.	Sections defined.	Approximate acreage of stock occupation.		Stock.		
		Cattle.	Sheep.	Cattle.	Sheep.*	Swine.
	Total	32,500,000	27,500,000	132,655	523,121	20,621
Northern	North of Millard, San Pete, Emery, and Uintah counties	13,750,000	13,750,000	68,023	334,749	13,386
Southern	South of Juab, Utah, and Wasatch counties, and west of Green and Colorado rivers.	13,750,000	13,750,000	48,132	188,372	7,235
Eastern	East of the Colorado and Green rivers	5,000,000	.....	16,500	.....	.....

* See note to Texas tables, p. 31. † Mostly work-cattle brought by the first Mormon immigration.

Total land area of territory.....acres.. 52,601,600
Total area of approximate available pasturage.....do... 32,500,000
Total population..... 143,963

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of neat stock the unit of stock, and considering five sheep to equal one head of cattle in relation to consumption of pasture, we have 237,279 units of stock occupying 32,500,000 acres, or 136.97 acres to the head.

OREGON.

HISTORY.

The history of Oregon includes that of Washington and Idaho to 1853, when Washington territory was organized. Although the coast was earlier visited by traders, the Columbia river seems to have been first entered so late as 1792 by Captain Robert Gray, of Boston. Lewis and Clarke reached Oregon by way of the Missouri river and over the mountains in their expeditions of 1804–'06. Astoria was founded in 1811, as a trading-post for the American Fur Company. It passed from Astor's control to that of the British fur-traders.

Oregon had but a small white population and a disputed national allegiance previous to 1846, when a treaty definitely recognized the claim of the United States. The early traders had some domestic animals, of which no definite records are accessible.

In 1836 (*a*) the mission party under Dr. Whitman crossed the continent, driving a few cattle over to Oregon.

In 1837 a company of the settlers brought 600 head of cattle into the Willamette valley from California, largely aided by the Methodist missionary, Dr. Jason Lee, who had entered Oregon overland in 1834. In 1842 and in 1843, respectively, emigrant parties, under the influence of Dr. Whitman, crossed the plains to Oregon, taking each time a number of cattle. The number in 1842 was small, but in 1843 the emigrants, under Dr. Whitman's personal leadership, brought 1,300 head of cattle.

a As indicating the recent development of Oregon and of the interior of the United States, it is worth noting that two missionary ladies, Mrs. Whitman and Mrs. Spalding, were probably the first white women to cross this part of the continent, and the first white women in Oregon, though they went out so late as 1836. Mrs. Beaver, wife of an English chaplain of the fur company, arrived by ship a few days before they reached the coast, but after Mrs. Whitman and Mrs. Spalding were within the territory Mrs. Beaver remained but a short time. A daughter of Mrs. Whitman, drowned in infancy, is reputed to have been the first white child born in Oregon, and a daughter of Mrs. Spalding the second, and still living at a recent date. (See Gray's *Oregon* and White's *Ten Years in Oregon*.)

Public attention was diverted from Oregon and the tide of migration was attracted to California very soon after the settlement of the question of national jurisdiction, and the region received little attention till the exhaustion of surface gold mines made agriculture again a prominent interest on the Pacific coast.

Between 1860 and 1870 there seems to have been a decrease in the number of cattle and an increase in the number of sheep and of swine of this region, but in the decade from 1870 to 1880 the cattle of Oregon and Washington have increased to 4½ times the number in 1870, sheep to 16 times the earlier number, and swine have doubled, which does not represent the full gain since the quality is also much improved.

PASTURE.

WEST OF THE CASCADE MOUNTAINS.—This section of Oregon held, in 1880, 25 per cent. of all the cattle of the state, and 37 per cent. of its sheep. Western Oregon is an agricultural country, where not too thickly timbered, and its live-stock management, principally for home demand, differs from the general system of free grazing. The high mountains, the immense timber tracts, and the rugged condition of what is not actually unavailable for pasture, forbid the bold individual stock enterprises common east of the Cascades.

There is an average fair quality wherever pasturage exists, but the better class is scattered here and there in small patches. In the great valleys wheat claims most of the soil. On patches of the coast region dairying flourishes and the ocean mists keep the grasses green in summer and preserve it from frost in winter. Because of the topography of the pasture, it is very difficult to estimate its extent, but the figures of available pasturage in the table of Oregon stock make an approximate showing.

NORTHEAST OREGON.—This section comprises the counties of Wasco, Umatilla, and Union, a country differing entirely from western Oregon. The climate is dry and subject to extremes, especially in the eastern portions; beyond the mountains there are extended plains with less frequent but bolder breaks and scanty timber. It is yet a grazing land, although more or less agriculture, with its settlements, land ownership, and fencing, has begun to crowd the ranchmen. Probably it will not now support more than one-third of the cattle that it fattened five or seven years ago. Sheep began to share ranges in 1873, and weeds have come in where there was luxuriant grass. Here, as elsewhere in Oregon, the valuable alfalfa has to some extent taken the place of the original pasture. It is claimed that the tramping of stock has produced a better water supply. The absence of winter pasture through much of this section was always an obstacle. Some hay is fed to small bands, but, as elsewhere shown, this is a poor reliance and of doubtful economy to any except farmers. The country west to the plains is rough, cut by cañons, and heavily timbered. Along parts of the John Day's river are tracts of sharp, broken rocks, standing as walls and called "rim rocks". Middle Wasco, about Crooked and Ochaca rivers, is probably the best pasture of this county. Southwest of that and just north of Lake county sage and sand appear. The upper part of Wasco, between the Deschuttes and John Day's rivers, not bordering the Columbia, is a good pasture region. There are about 3,000,000 acres of unsurveyed government land in Wasco county.

Umatilla, the next county east of Wasco, is three-fourths good rolling prairie and the timbered Blue mountains occupy the remaining fourth. Beginning at the bend of the Columbia, about the 119th meridian, the pasture lands are poorest along the river, but broader and improved as they rise toward the Blue mountains. Bunch-grass prevails and there is some sage on sand along the river, and rye-grass along the swales and water-courses. There is no underbrush in the open pine forests, but some grass. Pasture is very uneven in quality. The first sheep in Umatilla county were brought by Eli Stewart in 1862; now they come by thousands from the Willamette country and the eastern states. Agriculture and sheep-raising are dispossessing the cattlemen who find the remaining ranges much deteriorated from the luxuriance of ten years ago.

In Union county the Blue mountains and those in the east along Snake river restrict the pasturage. What remains is of a good quality, and the mountain parks increase its extent. The Grande Ronde valley, including Indian valley, is to a great extent fenced. Stock run there in inclosures during winter, and range free in the hills through the summer. There is no free range in the valley. Ranching begins along Wallowa creek. Because of the natural confines, stock is easily gathered and range herding is but little practiced.

The available pasturage of northeast Oregon provides about 40 acres for each unit of stock.

SOUTHEAST OREGON.—Southeast Oregon comprises the counties of Baker, Grant, and Lake. The pasturage is generally good, except the timbered mountain heights in the northwest, and a few pieces on Willow creek and Snake river, and along the whole extent of the Cheyenne trail for a couple of miles in breadth.

Sage-brush continually interrupts the grass of the pasture, but compensates in part for this with its winter value. The ranges of Baker county, although occupied fully, are not overstocked, and they yet remain mainly free and open over most of the county. There are a few sheep, and there is some farming. The mountains, densely timbered down to the plains, afford many parks for summer grazing. Only in the extreme west, south of latitude 44°, is there scarcity of water.

The prevailing and best grass is the bunch-grass. Wild rye, which is good both standing and as hay, is plentiful in the northern portion. Red-top and blue-joint appear in limited quantity. Salt (alkali) grass is abundant, particularly in the south and west. Besides these there are white sage and other wild forage. Grant county has the

free-range facilities of Baker county, but the pasturage is not so good on the average. The forage plants are the same, except that sage is more common. In the southwest and north of Warner lake is what is called a "desert"; it is not entirely barren, but is too dry in summer for occupancy. At the headwaters of the John Day's river, southwest of the Blue mountains and north of the Malheur reservation, the pasture is mostly exhausted. Farms, with fencing, line the John Day's river. The stock range there in winter and move to the Bear valley country in summer.

The best stock ranges are in the eastern part and in the southeast corner of the county, especially those in the Malheur Indian reservation and about Stein's mountains. The Stein's mountain region was overstocked at the beginning of 1879. In that year N. R. Davis, of Cheyenne, took from it 12,000 head of cattle. By the close of 1880 it had recuperated materially. Fencing has begun on the best conducted ranches in the Stein's mountain region. On the Glenn and French ranches there are over 30,000 acres inclosed, the "rim-rocks" greatly aiding this. There are instances in this county where, by a comparatively small use of fence, 4 or 5 miles of continuous inclosure have been constructed. Where wood is used entirely, and it grows in the neighborhood, fencing costs about $225 per mile. Bear valley, from Cañon city to Soda springs, and Silver valley, from Soda springs to Trout creek, about latitude 43° 50′, are heavily timbered. Otherwise there is but small amount of forest, except on the mountains.

Lake county is appropriately named. It is a cold region, more elevated and rugged than Grant and Baker counties. Its soil, bearing good grasses where not mountainous and timbered, is of volcanic origin, and lava beds, of rugged and partly barren ground, are found east of Langell's valley and north of Sprague's river for a length of 30 to 40 miles by 3 or 4 wide. The county is about equally divided between mountain and so-called prairie. Sprague valley, which has a length of about 12 miles and a breadth of 4 miles, is perhaps the finest piece of pasture in the county, but it will soon be utilized in agriculture. This valley is terminated abruptly on the south by high, timbered mountains. To the north gradually rising hills provide a continuance of excellent grasses. In the west the valley is gradually lost in the foot-hills. Southeast of its eastern end rises a range of pine- and fir-clad mountains trending to the south.

Southeastern Oregon, as a whole, has nearly twice the available pasture of the other sections of the state, and the number of its neat cattle is about double what are found in either of the other sections. There are comparatively few sheep to each unit of stock in southeast Oregon.

CATTLE.

We find generally in Washington territory and in Oregon that free range pasturage, originally strong and luxuriant, has been injured by overstocking. The results of this condition have been intensified by two consecutive bad years, by the increase of sheep, and by the growth of settlements.

In both Washington and Oregon—the Yakima river country and the western two-thirds of the great plain of the Columbia of the former, and in southern Wasco, northern Lake, and most of Grant county of the latter—the situation remains more favorable to stockmen than to farmers, although the natural ranges have greatly deteriorated.

The three steps in cattle-raising are, first, open range; second, fence ranching, to preserve grass, to which is often added irrigation to improve it and to graze it economically, and it may or it may not be to make hay; finally, feeding. This last is, of course, within fence, and sometimes under roof, using not only grass standing or cut but also the roots and grains of agriculture. The first system means new country and free land; the next shows the exhaustion of natural range, or the transition from an open country to population and agriculture; the last means a condition of agriculture where population is dense, land valuable, and meat high. Cultivated crops yield a larger amount of food for stock than the same area will furnish if in wild grass. Therefore all lands not absolute desert have been reckoned as available pasture.

In the spring of 1876 the demands of the live-stock markets in Wyoming, Colorado, Nebraska, and Montana, where cattle occupy open ranges, first induced a general driving out of cattle from Oregon and Washington to assist in stocking these regions. The immense drives of 1880 from both Oregon and Washington, the advance of sheep husbandry and agriculture from the west, and the disastrous season of 1879–'80, all concurred in lessening materially the importance of this industry in both Oregon and Washington, a result especially noticeable at the time of this investigation.

In western Oregon agriculture so fully occupies the pasture lands that cattle-raising is almost wholly confined to the farms, and it is only in southeastern Oregon that fencing of great pastures is practically unknown, and that cattle occupy free range of government land.

The neat stock of Oregon and Washington may be said to be more uniform in grade than the cattle of any other of the contiguous states and territories, having been less exposed to interbreeding with either the California or the Texas stock. In the past many bands of California cattle have entered Oregon. During 1871, 1872, and 1873 a few herds of Texas cattle were driven into Oregon. These failed to affect, to any noticeable extent, the character of Oregon cattle. American, that is native, cattle stock all the ranges occupied throughout the country, and up to 1874, when the pastures began to be overstocked, it was claimed that the average beef produced was superior in weight and quality to that grown on any other open pastures west of the Missouri river.

Many stockmen believe that the deterioration of the feed caused by overstocking and long-continued grazing, as well as by the incursion of sheep from the western counties of Oregon, prevented cattle from retaining the size and condition attributed to them when the ranges were fresher.

Owing to the purchase of herds in the northwest to stock ranges in Wyoming, Nebraska, and Montana, the cattle business for the past six years has had a different end in view from that formerly prevailing. Stockmen have more generally turned their attention to disposing of young cattle to purchasers from other grazing states and territories. A system of sales to special drovers and of personal drives to Wyoming and Colorado was thus inaugurated in 1875. This assumed larger proportions each succeeding year, and culminated in the great cattle-drives of 1880, which probably will not be equaled in the future. The counties of Grant and Baker, in southeastern Oregon, presented in 1880 the best examples of handling cattle on a large scale. In many parts the settlement of the country by small farmers, the fencing up of stock water, and the overstocking of the pastures by sheep and horses, are results which have attended the more permanent occupation of the country, and have very generally forced out the large bands of neat stock formerly ranged in Wasco, Umatilla, and Union counties.

In Baker and Grant counties, where the business of raising cattle was conducted on an extensive scale, many large herds still occupy the wide areas of country furnishing winter and summer ranges, as yet only slightly injured by overstocking and not materially curtailed by the incoming of sheep or of small farmers. Among cattle-owners of this region the advantages and the drawbacks inseparable from raising cattle on large unfenced ranges find good illustrations. The cattleman usually owns, by government title, or controls by virtue of first occupation, a claim of land lying adjacent to some stream or spring where his home ranch is located, consisting of a house or a cabin for the herders, stables for horses in active service during the winter, and corrals for branding stock.

A certain amount of meadow land is usually inclosed from which to cut hay for the saddle-horses during the cold season, but beyond this, and perhaps a pasture for horses, little fencing is usually done, no provision being made to feed range cattle during any portion of the year. In some instances in Oregon the plant embraces more pretentious buildings, a hay claim, and fenced pastures of very considerable extent, but commonly the improvements are limited to merely a comfortable log cabin and a rough stable for half a dozen horses, with stock-pens adjacent in which to corral and brand cattle. If the herd handled is a large one, and the cattle occupy a wide extent of country, several other corrals are generally put up at points convenient to the usual rodeo grounds. At such inclosures the necessary marking and branding of calves can be effected without the trouble and injury to the cows and calves of driving them a long distance to the corrals at the home ranch, or of doing this work on the open prairie; the latter practice is always injurious to cattle, as it is apt to overheat the calves and make the whole herd wild, besides wearing out the saddle-horses unnecessarily. In addition to his buildings and corrals and limited fencing, the large cattle-raiser is possessed of a camp wagon, work animals, harness, and saddles, and a band of well-broken cow-horses sufficient to allow to each of his herders several spare animals.

With this moderate outlay in equipments the Oregon cattle-raiser is prepared to conduct a business which involves a capital in cattle of many thousands of dollars. A noticeable feature of cattle-raising in Oregon, as in the adjacent states and territories, is the change of pasture made during the year between winter and summer range. In some localities this movement is instinctive on the part of the cattle; in others the stock is gathered and driven to the hills in April or May to range during summer, and is returned in November to the lower winter ranges. The Blue mountains, Stein's mountain, and the spurs of the Cascades extending east into Lake county, are the regions which furnish in their well-watered valleys and slopes the summer pasture for eastern Oregon stock. During the spring, soon after the grass is high enough to allow of handling the range cattle, a general meeting of the stockmen in one region of common occupation occurs and a "round-up" or "rodeo" is organized which proceeds to "work" the ranges according to a regular plan, which it is intended shall comprise the whole of a given country, so that no cattle ranging in that section shall escape attention. These "round-ups" are under the general direction of some man, whose knowledge of the stock, the country, of handling cattle, and of the marks and brands owned in his region entitles him to lay out the plan of operations for the assembled stockmen. The scale on which a "round-up" is conducted does not approach in dimensions the importance of the same event on the more heavily stocked ranges of Wyoming and western Nebraska. It is rare that more than twenty-five or thirty herders accompany one "gather", while the extent of country which is rounded up during the progress of the rodeo is much less extensive than that embraced by the operations of the general "round-ups" along the North Platte river. The custom prevails among owners of large herds in Oregon of handling their stock independent of smaller proprietors. In general object and methods of handling cattle the "round-up" of the open ranges west of the Rocky mountains is identical with that practiced on the plains. Camp wagons follow the stockmen through the country "worked", and each day a new camp is made, from which, on the following morning, all the cattle within a radius of eight or ten miles are surrounded and driven to some flat or prairie convenient for rounding them up. While some of the riders keep the stock bunched by riding around the skirts of the herd, others enter the "round-up" on trained horses and separate or "cut out" first the cows and calves. They afterward separate the "dry stock", consisting of all other cattle, provided the stockmen present desire, as is generally the case in the spring, to gather all the animals of their own brand which can be found in order to move them back to their own range, from which they may have drifted during the winter storms.

The "round-up", having been thoroughly reviewed or "worked" by all those present who are looking for cattle, is turned loose, and the remaining cattle, consisting of animals belonging to the range and estrays unclaimed by their owners at the time, are permitted again to seek their usual feeding grounds. The cows and calves are now driven to branding pens, usually adjacent to the rodeo ground, where, after the calves are properly marked and branded, they are again turned out on the range, or, if belonging to another locality, are held with the other estrays and guarded night and day until enough cattle are gathered to warrant a "drive" to the range where they belong. A "round-up" thus traverses a region of some 75 or 100 miles long by 25 or 35 wide, and by gathering every herd of cattle met with during the daily reconnaissance or "circling in" of the vaqueros engaged in the work, each cattle-owner has an opportunity of finding and restoring to their proper pasture-grounds the cattle of his brand, provided no unusual storms during the winter have drifted his stock beyond the limits covered by the "round-up" in question. The large owners whose cattle range over several counties send men to represent their interests in the various "round-ups" of the neighboring regions. These men accompany, gather, and drive back such estrays of their employer's brand as are recovered.

After the spring work a short interval of rest is usually allowed in which to recruit the saddle animals, but in large cattle-camps the gathering and branding of the spring are soon followed by similar work in some other part of the extensive ranges occupied by the herd. The steadily increasing demand for western stock and good prices realized from sales have directed the business in Oregon toward raising young cattle for market; while the extension of sheep-husbandry and agriculture and the annoyance to large owners from these sources have given additional impetus to this trade.

Many owners have for several years made annual drives of their own cattle to the markets farther east. When the buyer appears on the ground in Oregon the case is somewhat different, and the cattle-raiser then delivers a herd at a certain time in May, usually at some place designated in the contract made during the previous winter between the trail-driver and himself. When the time for delivering the stock to the driver approaches, the cattle-raiser, who has either worked in co-operation with some "round-up" or has, perhaps, if he is a large owner, gathered his stock with an outfit of his own, prepares to fulfill his contract, having the cattle under close herd in the neighborhood. On the day which has been fixed for the transfer the cattle are "rounded up" and the stock of different classes and ages are separated and tallied by "cutting out" in the presence or by the personal assistance of the two parties trading in the stock.

The cattle having been separated in accordance with the contract, the new owner brands them with his private iron or "road brand" preparatory to starting on the trail. Such a brand is necessary for establishing his ownership in case of the cattle striking back to their old range, and to establish his own perfect claim to the cattle, which still have their former owner's brand. Sometimes in the case of small herds the contract requires the cattle to be counterbranded by the seller before delivery, in which case the counterbrand and the road brand may be put on at the same time, and the herd can be classed out and tallied by running through a branding-pen "chute", after which the new owner must hold the herd purchased at his own risk.

Having completed his arrangements promptly, so that no cattle may escape and return to their old range, the driver starts his cattle in droves numbering from 1,200 to 2,500 head, according to the kind of cattle received or the amount of the purchase, each in charge of 12 or 15 men. A forced drive is usually made for two days to get the stock well away from their accustomed range, and great care is exercised in moving the herd till accustomed to driving.

The production of beeves in Oregon has been much reduced by the prevalent custom of selling and driving young animals. The aggregate, however, of three- and four-year-old steers raised has always been considerable, and many droves of this class of stock have annually been marketed in the California and in the local markets and as feeders in the states and territories farther east. It is very generally conceded by stock-raisers themselves, and very strongly asserted by many drovers, that the average beef animal of the country has not of late years attained a weight and excellence proportionate to the improvement in blood which the introduction of improved bulls among the range herds has undoubtedly brought about. The general explanation of this failure of beef animals to lay on fat as readily as formerly is that the overstocking of ranges has so generally occurred as to cause injury to the bunch-grass, white sage, and greasewood, which constitute the winter pasturage. The same effect of overstocking has been noticed on a majority of the cattle ranges of Utah, Nevada, and Idaho. As long as Oregon pastures were sparingly stocked, and the feed was fresh and, comparatively speaking, luxuriant, each "cow" had abundant feed winter and summer, and the beef-cattle turned off were remarkable for their size, weight and quality, although the average animal was of ungraded American stock.

Stockmen assert that it is now difficult to find a fat cow on ranges in February or March, while six or eight years ago it required but little riding to gather a small band of beeves fit for marketing at any time during the winter or spring. A general attempt has been made for several years by the cattlemen of Baker and Grant counties to bring in a better class of bulls than were formerly used, and the average quality of range cattle has been unquestionably raised. Had the pasturage remained as good, this improvement would have been more satisfactory and noticeable, as already explained. Cattle after reaching their winter ranges in October and November subsist

largely on the browse-feed and bunch-grasses of the great sage-brush valleys of the southeast of Oregon, popularly known as sage deserts, where but little attention is given them by the owners except to keep a general lookout as to their movements, which is done by cowboys who ride the range. This practice of letting cattle shift for themselves to a great extent during the cold season, which has been found most favorable to the stock, allows the cattle-raiser to reduce the number of herders employed at that time and so to curtail the expenses of his camp. Experienced vaqueros are paid from $35 to $40 per month, while ordinary ranch hands are paid $30. Board is also furnished to all employés.

Each rider is furnished with from three to six horses, which as a class are very excellent stock in southern Oregon, and are more serviceable in running cattle than the stock horses of northern Oregon and Washington, among which the inferior Indian pony predominates. Many fine bands of saddle animals were found in northern Nevada and southern Oregon, and not unfrequently $60 per head all round was the value placed on them, while individual animals of tried stamina and well trained often sell for $100, an amount seldom realized for the Texas cow-horse.

In the management of a herd of cattle during the season of active work, usually from April until December, about three men in the saddle are required to each 1,000 head of cattle, above which it is not necessary to increase the force in the same proportion, since a dozen vaqueros can handle equally well, though with more riding, four, six, or even eight thousand cattle, except at general round-ups. When the owner's interests must be represented, additional men are required. A foreman ("mayordomo") accompanies the crew of vaqueros in their work, and on his energy and skill in handling both men and stock the success of the business in no small degree depends. Often the owner accompanies his men and directs the summer operations; but most frequently in the large cattle camps a special foreman is employed at wages ranging from $60 to $125 per month. The foreman shapes, as it were, the campaign for the season, and he must be the man who leads.

Throughout this portion of Oregon and in adjacent northern Nevada many California vaqueros have found employment since the decline of cattle-raising in their native state; these men, both Mexicans and Americans, are skilled herders, excelling as riders and in the use of the riata (lasso). It is commonly asserted that a crew of eight or ten of these old Californians under a good mayordomo will handle more cattle in a season, with better results and with less wear and tear on their saddle animals, than an equal number of men selected from among the stockmen of the plains or of Texas. Whether this comparison is ajust one or not, it is a fact that fewer riders are engaged to do the same amount of work than in other stock countries. In northern Oregon and Southern Washington, where the cowboys are almost entirely American or half-breeds, the same standard of skill in handling cattle was not claimed.

Some of the drawbacks to cattle-growing and especially to improving the grade have been already alluded to; there are further reasons which always appear in breeding cattle on an open range that hinder even the most zealous and intelligent cattle-owner in the improvement and increase of his herd. When stock mingle promiscuously there can be no especial grading up, only a general one, by which the cattle of a wide expanse of country are affected. A stockman may turn upon his range bulls of blood and quality superior to those in common use, but there may be twenty brands besides his own on the range to divide the benefits.

Many stock-growers in Oregon, as in every similar region, are unwilling to incur the expense of good bulls, and by either turning loose "scrub" sires or none at all greatly retard improvement. Many complaints of a lack of the proper proportion of bulls to cows on the range were noted, a condition of things which seems almost universal on stock ranges held in common by a number of owners. It is the almost universal custom to permit bulls to range throughout the year with the other cattle, thus insuring the untimely dropping of many calves in winter and early spring, when severe storms often prove fatal to both cow and offspring, and this is another serious source of loss.

With the lack of large pastures in which to graze bulls if they were to be gathered and the futility of such a project, unless all owners co-operated in the movement, any remedy to this evil seems impossible. The cattle-raiser on an open range begrudges every expense, especially such as may not secure to him the sole benefit, and it is only among herds grazed wholly or in part within fencing that a marked improvement in grade and in the rate of annual increase occurs.

It was formerly the custom of the stockmen in southern Baker and Grant counties to drive their beef, annually, to Winnemucca and to Reno in Nevada, from which points they were shipped to San Francisco or were consumed in the mining camps of western Nevada. These markets are still sought by the breeder, but in general a younger and lighter class of beeves has been driven, which finds more favor in the demands of California slaughterers.

The great tide has taken, however, the direction of Wyoming, where all classes and ages of cattle have found a ready sale during the past six or seven years.

In certain herds of Oregon cattle, aggregating 20,680 head in 1880, as compiled from answers to circulars, the composition was as follows: 263 bulls, or over 1 per cent. of the whole; 6,595 cows, or 32 per cent.; 2,966 beeves, or 14 per cent.; 3,102 two-year-olds, or 15 per cent.; 3,929 yearlings, or 19 per cent.; 3,825 calves, or 19 per cent. The number of calves dropped per 100 cows was 83; of these 58 survived to yearlings.

The estimated average annual loss among cattle over 12 months old was 6.3 per cent.

LIVE AND DRESSED WEIGHTS OF GRASS-FED CATTLE.

[Furnished by Mr. Johnson, of Central Market, Portland.]

Age of cattle.	Live weight.	Dressed weight.
Two-year-olds	875 to 900	450 to 475
Three-year-olds	1,025 to 1,075	525 to 550
Four-year-olds	1,150 to 1,250	600 to 650

The estimated average value of cattle in Oregon in 1880 was bulls, $31 42; cows, $11 60; three-year-old steers, $17; two-year-old steers, $13; yearlings, $8; calves, $4 66; beeves, $24.

The estimated average weight of a three-and-a-half-year grass-fed steer was, live weight, 1,125 pounds; dressed weight, 584 pounds.

SHEEP.

Wool-growing and sheep-raising, so intimately connected with agriculture, have great importance in western Oregon. A representation of this industry is given from Hon. John Minto, who, in reply to a special circular of inquiry, has presented the results of his study and experience in the business. We find the available pasturage in western Oregon in 1880 to have furnished about forty-eight acres to each unit of stock, counting, as usual, five sheep to one head of cattle.

Sheep originally came from California, Missouri, England, Vermont, Australia, New Zealand, and Canada. Of late years few sheep are brought in; these are of improved stock, bred in California, or on the Atlantic side.

Formerly the drive from California began at Sutter's fort, near Sacramento, and went up Sacramento valley across the Klamath valleys, Roger's river, and Umpqua, to the Willamette valley. From Missouri the drive was up the Platte valley and across the Rocky mountains via South pass; thence down Bear River valley; leaving Salt Lake on the south, it crossed into the Columbia River basin at fort Hall, on the Snake river, and followed that river via Boisé City, and into Oregon, on trails between old fort Boisé and the mouth of the Wieser, leading north to the Grande Ronde valley, whence it crossed the Blue mountains to the head of the Umatilla, which it descended to the Columbia and down that to The Dalles and Willamette valley. Now what flocks come from California take the route by way of Redding, across the Klamath lake basin and along the east side of the Cascade mountains for eastern Oregon, Washington territory, and Idaho.

To illustrate the sources and growth of the Oregon sheep husbandry, I forward an article which is a condensation and continuation of a paper read by me before the Oregon State Agricultural Society in 1863. The Mr. Lease mentioned in the statement herewith was a native-born citizen of the United States, owning sheep in California in 1837.

SHEEP AND WOOL IN OREGON.—HISTORY OF IMPORTING AND BREEDING SHEEP AND OF WOOL-GROWING IN OREGON, WITH ITS PRESENT STATUS.

By Hon. John Minto.

The first sheep brought to Oregon were driven from California by an American named Lease, in 1838, and there is some reason to believe that he made a second drive in 1842. They were light-bodied, dry-fleeced, kempy, and inferior sheep. In 1844 Mr. Joshua Shaw and his son, A. C. R. Shaw, brought the first few across the plains from Missouri. In 1847 a Mr. Fields brought a lot of good sheep across the plains. In 1848 Mr. Joseph Watt, of Amity, brought 330 head, considerably infused with Saxony merino blood, and among them were 5 rams and 2 ewes that were pure Saxony and six high grade Spanish merino ewes. In 1851 Hiram Smith brought some full-blooded Spanish merinos; I never was informed as to the number. In 1854 Dr. Talmie, of the Puget Sound Agricultural Company, drove into the Willamette valley some 1,500 head, descendants of Lease's California sheep that came in 1838, among which were some nearly pure southdowns, Leicesters, and merinos. In 1858 Martin Jesse brought in 20 head of Macather Australian merinos that were imported into San Francisco by J. H. Williams, United States consul at Sydney, in 1857. In 1859 R. C. Geer, of Waldo hills, imported southdowns of the famous Jonas Webb breeding. In 1860 Rockwell & Jones imported French and Spanish merinos from Vermont. Later in the same year Jewett & Lane brought in some pure and some graded French merinos. In 1861 Donald McLeod brought 150 thoroughbred Spanish merinos from Vermont across the plains. In 1864 John D. Patterson brought and sold in Oregon French and Spanish merinos. Mr. John Cogswell imported New Oxfordshires and Hampshiredowns about 1861, and about the same date Hon. Ben Stark imported a single cotswold ram. Since that date others have brought cotswolds and Leicesters from the Atlantic side, and others have imported from New Zealand and Australia. Nearly all the sheep brought to Oregon of late were Spanish or American merinos, except those which were of the largest and highest kept style of French merinos.

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The southdowns and Hampshiredowns are no longer kept here of my knowledge, and of late years there has been less and less interest manifested here in the best long-wooled families.

It is not that these breeds cannot be kept in western Oregon and made to produce combing-wool of excellent quality. The awards of first-class medals by the World's Fair of 1876, and within a few weeks past at the wool exposition held at Philadelphia, proves that western Oregon can excel, both in long-combing and fine-clothing wools; but our experience proves that combing-wool sheep require constant care on the part of the owners to keep them in the proper condition. There are a few locations in western Oregon of which this is not true. There are a few ranges of limited extent that are better adapted to long-wooled sheep than to any other. There are also farmers who so keep their flock under conditions generally not favorable that they bring to market a very good article of combing-wool. But such are exceptional men at present. The general condition of the climate of western Oregon, and the pasturage furnished either naturally or by the help of the farmer, are such that there is a steady deterioration from an average standard of cotswold, Leicester, or New Oxford sheep. The flock grows gradually more and more leggy in appearance, the wool becomes shorter, drier, and less lustrous, and in many cases the sheep, while comparatively young, lose considerable of this wool before ordinary shearing time.

For these general reasons those who take interest enough in the sheep they keep to use any pure-blooded sheep for the purpose of improvement, or even maintaining the measure of profits received from their flocks, look, in a large majority of cases, toward the merinos. This is so to such an extent, even in western Oregon, that I think that I am safe in assuming that at this time the amount of merino blood in the sheep of the country is equal to that of all other breeds together, common stock included; that is, I believe the sheep of western Oregon will grade nearly or quite half-blood merino.

Owing to the rapid extension of wheat-farming and an increasing use of sheep as gleaners and in weeding wheat fallows, where they are in many cases kept without water and on short feed during the following season, even the merino blood is not sufficient to counteract the tendency to deterioration and dryness of fleece, and flocks so treated are retrograding. Also wheat farmers who thus use sheep have, as a rule, not yet adopted the plan of liberal feeding in winter, to make up in part for short, dry feed in summer.

Wool growers in eastern Oregon and Washington, and in fact in all the country between the Cascades and the Rocky mountains, are advancing more rapidly than those west of the Cascades in the improvement of their wools. This advance is nearly all in the direction of the American improved merino; so much so that I believe there are ten merino rams purchased for use there to one of all other breeds. The southdowns and different families of combing-wool sheep have been tried there sufficiently often to prove that the climate and other conditions of sheep husbandry in that section of country are still more unfavorable for long-wooled sheep than is the case, as I have presented it, west of the Cascade mountains in the Willamette valley. It is found in practice that in a flock of mixed breeds the long-wooled keep on the outside of the others in search of feed. Observation proves that when the short-jointed, round-bodied merino grade, weighing 130 pounds live weight, has fed to its satisfaction and is ready to lie down, the long-wooled, weighing 180 pounds, has not fed according to the requirements of its nature and size, and in consequence is restless at camping time. During feeding hours such sheep require the constant care of the herder to prevent them from leading the flock to travel faster and farther daily than is good for it. Then, when the season renders it difficult for a medium sized sheep to get a fair living—a condition suitable to growing fine wool of satisfactory quality—the combing-wool sheep is not getting the amount of feed necessary to keep its wool in healthy growth, so both wool and sheep are deteriorating. On fresh range this is not the case, and for a while a very good staple of long wool can be grown on such range, but the causes I have indicated very soon begin to operate, with results that fully justify the wool-growers for breeding more and more toward the "clothing-wool" sheep.

The present wool crop of the Columbia river valley, including east and west of the Cascade range, will very nearly grade as "medium clothing staple". There are, of course, entire clips that would sort into combing, coarse delaine, and noils. There are flocks of long wools that have been kept under the most favorable conditions. There are still larger numbers of flocks of this same kind that have been bred toward the merino, so that there is a large proportion of "medium to fine delaine wool", according as the flock has taken the first, second, or third cross toward fine wool. These exceptional lots of combing and delaine wools receive no discrimination in their favor in our local markets. The custom here is to buy wool by the reputation of the districts where it is grown, as "Douglas county wool", "Willamette valley wool", or "eastern Oregon wool".

Sheep are driven from Oregon to California, Washington territory, Idaho, Montana, and Nevada.

The general movement is from the Willamette valley eastward, up the main Columbia valley via Dallas and Walla-Walla into eastern Washington, western Idaho, and Montana. At nearly all points of the vast grazing country east of the Cascades cattle are giving way to sheep. Drought induces the movement of sheep out from California, and after very disastrous years California must restock herself This causes the reciprocal exchanges between California and Oregon. In 1850 and 1851 Oregon sent sheep to California. For several years following the dry summer of 1864 California exported to Oregon. In 1861 the movement was toward the southern state, and it was estimated that 80,000 sheep went from the Willamette valley to California.

The cost per head, say, of 3,000 sheep, traveling 500 miles in eastern Oregon, exclusive of tolls and ferriages, is about $1 per mile, or $500 for the drive. This is not from practical experience, but is an estimate from hearsay.

The average number of miles sheep will drive in a day is ten, but I have had small flocks drive twenty-five miles in a day when returning from a rough mountain range to the valley in which bred.

The average composition of a flock of sheep, say, of 5,000, on January 1, is 40 rams, 2,000 ewes, 1,30 0wethers, 1,660 lambs—total, 5,000.

Of the 1,660 lambs 860 should be males and 800 females.

About 2,200 lambs should be dropped to 2,000 ewes, and 1,800 in a good season and with good care should survive weaning. I have had no personal experience with large flocks. My estimate is based on what I have known here in western Oregon with flocks ranging from 100 to 300. I have run sheep in this way since 1849. The difference in increase is dependent upon breed. Fresh range on good grass has a great influence; on such range grade southdowns should produce 125 lambs to the 100 ewes, when merinos would bring but 90 lambs; but when the lambs are weaned the values of the merinos would be, for wool-growing purposes, 125 against 90 for the southdowns. In regard to the proportions of sex in lambs, I have found the condition of the rams to influence the sex of their progeny.

My flock of high breds and thoroughbreds, from which all sales are of breeders, is too small for its cost of labor to serve for general guidance. My sheep are shedded in winter and very bad weather, and they receive at all times my personal care. Shearing costs 8 cents per fleece and board of shearers; 75 cents per day for each man, boarding home price—30 cents per day where the shepherd provides board for his laborers. Chinamen board themselves.

In western Oregon there can hardly be said that any system of changes for summer and winter grazing is followed. Generally sheep are kept as gleaners of wheat fallows and wheat stubble. They receive but little attention, changing from the fallow ground of the summer months to the stubble land that will be fallowed in part or whole the next season. Shedding and feeding are exceptional where sheep are held on pasture land.

I commence to feed about December 1, and continue it until about April 1. Last winter I fed barley and barley straw with good results to the flock of about 200 head that consumed 200 bushels of barley costing $108, two tons of barley straw worth $20, and 400 pounds of flax-seed meal worth $10, or $138 total cost of feed. I sometimes feed clover and timothy hay instead of the above articles, and they do equally well. These feeds are only when the sheep cannot run on pasture. Hay is worth $8 per ton. Ordinarily 250 pounds of good hay would be good feeding for 100 thoroughbred merinos of mixed ages per day.

The breeding season with common sheep is for six weeks from December 1, so as to have the lambing come in April, but my system with a small flock, raised for a special purpose, is to put the rams with the ewes in September, and have the lambs dropped in February.

I think castration should be performed two weeks from birth.

As to the smallest number of sheep that can be economically run in one flock, supposing the owner to have but one, in western Oregon, as the sheep are not herded, the flock may be of any number, according to the size of the inclosure or range. In eastern Oregon, where a herder is necessary, 1,000 head is the smallest number that will justify the expense of a herder.

The average management in western Oregon is for the most part subsidiary to wheat production to such an extent that with most sheep-owners the flock is kept only to glean the stubble in the winter and to eat off the wild oats, sorrel, and other weeds on the summer fallows. Some farmers who do not raise more grain than is required for home use, shed their flocks and feed in the worst weather. I do not think that sheep-husbandry is as well conducted as it was ten or fifteen years ago, before wheat was grown for export to Europe. Since that began the best grazing lands have been put under cultivation, and those lands now used for flock production as the first object are either rough hills or timber or brush.

The lands of the chief valleys of western Oregon are all in private hands. The great extent of hill and mountain land inclosing the main valleys is still government land, and is used as free range by the adjoining owners. In rare cases there are some private holdings rented out with the stock upon them. As a rule the stockman keeps his stock upon his own land.

In eastern Oregon, where but a small proportion of the country is private property, it is the custom among settlers to regard the range about a watering place, where a man has built a corral, as that man's special premises, not to be intruded on by the stock of others.

In the Willamette valley, where are most of the best lands, they are covered by donation patents to pioneer settlers; these properties are being subdivided. South of the Willamette, where grazing is more common than cultivation, the lands are becoming fenced. I think, however, that the general tendency west of the Cascades will be toward smaller farms for many years yet.

I can only estimate how many acres of average grazing land are required to keep 1,000 head of sheep throughout the year, so much depends upon circumstances. Natural pasture left to itself may, perhaps, carry 1,000 head on 1,000 acres; by allotments of subdivisions for change and recuperation, and by sowing the best grass seeds, 500 acres should carry 1,000 head of sheep.

The general effect of sheep is to improve the pasturage. Under very close feeding some kinds of grasses quickly disappear, but other plants (wild), as alfileria, come in, and where nature is assisted with the seeds of the white clover and narrow-leaved plantain (rib-grass) and other good grasses the pasturage will improve.

Wool is my object, and I breed toward the merino when the ewes are common stock to begin with. I commenced breeding thoroughbred merinos twenty years ago.

My ideal sheep for wool-growing is a short-jointed, sound-bodied, even-fleeced, fine-wooled sheep without horns or large wrinkles, vigor of a southdown, with the docile feeding habits of a merino; the fleece charged with plenty of free oil or yolk to defend the wool from the weather, but not overloaded with gum; live weight 100 to 150 pounds. I have bred for that style of sheep for sixteen years, but I cannot change the popular preference for big horns, heavy wrinkles, and a superabundant yolk and gum.

A sheep of that size and form will herd in larger flocks and feed itself on shorter pasturage than a larger animal; it will yield a greater proportion of fleece to live weight, and of scoured wool to weight of fleece, than a larger-bodied sheep of more gummy and yolky fleece. The wether of this description keeps in good order for mutton upon pasture that cannot keep a larger sheep in required condition; the flesh is fine-grained and sweet; it suits all tastes that prefer flesh to tallow. In my crossing experiments, of which I have made many, I have found this style of merino crossed with the Leicestershire to produce an excellent delaine wool.

The merino gives the herding instinct. Highly bred lambs of the British breeds are not as hardy as those of the common blood, nor are the ewes so prolific. In my opinion, both the Australian and the French merinos are more hardy as lambs, and the ewes are more prolific than those of the Vermont merinos.

I should say one-third at least of the sheep in this state are three-quarters improved blood.

The average class of wool produced through this section of country is between one-half and three-fourths merino. My wool classed in 1875 less than half-blood merino. My flock of thoroughbreds and grades averaged 7¼ pounds. The average price of my last wool sold was 26½ cents for unwashed fleece, classed as medium clothing wool.

My flock of about one-third grade of all ages, some of which were shorn at nine months' growth, and all but eight less than a year's growth, sheared an average of 8½ pounds. When I have taken care to keep the yield of my thoroughbreds, I have the rams of three years old to average about 16 pounds; ewes of the Spanish merino type, 9 pounds; ewes of the French merino type, 10 pounds; ram lambs, the first year sheared, 8 to 15 pounds. The sheep were sheltered at night and took the weather during the day. These sheep gain in weight of fleece when transferred to eastern Oregon. I have known a ram that sheared a first fleece of 12 pounds yield 24½ at seven years of age.

If none was used for mutton, or for sale in any way, a flock of sheep would treble at least in three years, if in a small flock on fresh range; *i. e.*, a flock of 100 common ewes would give a flock of 300 head at least in three years.

One ram should be apportioned to 100 ewes if mature and cared for; two, when on free range and left to themselves. Some of the best sheep I have have been inbred for twenty years. The diseases to which sheep are subject here are scab, flukes in the liver, and blind staggers. The fluke is believed to originate on damp land and shows itself in the ducts of the liver. The blind staggers never affects sheep on pasture.

The southdown and merinos are the most hardy. The long-wooled English breeds are more liable to catarrhal diseases than any other.

The winter of 1861–'62 destroyed many sheep in western Oregon, and about all east of the Cascades. Snow then covered the ground about Salem for seven weeks—the longest time I have known during thirty years' residence. For the last five or six years scab has prevailed extensively. (*a*)

It will be observed that Mr. Minto's personal experience is in the case of a small, choice, carefully tended flock. His estimates regarding large flocks would be greatly modified by variation of care and other circumstances.

Over all of eastern Oregon and Washington, the manner of occupation by stock-owners is by ownership of the land which contains the water. The amount of government land one grazes over is all the neighboring country dependent upon the water which he owns. Otherwise, in using the government land, the various herdsmen have mutual understanding of each other's range, and generally respect it. On an average, over eastern Oregon and Washington, about 25 per cent. of the sheep are three-quarters improved stock, *i. e.*, twice crossed. Many men who have left their sheep without shelter or feed other than what nature provides are meeting failure in their investments, but the records of skilled sheep-raisers, who provide some forage and cheap, dry shelter for exceptional winters, and care for their flocks in lambing time, show excellent profits. The following memorandum

a For the winter of 1880–'81 the losses are now known to have been very heavy in some districts in consequence of deep snow and the general severity of the weather.

of ten years' experience of a sheep business in Umatilla county is from the books of a firm owning 20,000 head January 1, 1881:

January 1, 1870, we had 1,512 sheep; sold during the summer 460 head; raised 700 lambs, and sold wool to the following amounts:

1870	$663 00
1871	1,363 25
1872	2,583 05
1873	2,911 36
1874	3,653 28
1875	4,754 75
1876	5,287 50
1877	9,309 44
1878	13,626 00
1879	18,600 00
1880	27,395 00
Total sales of wool	90,146 63

During the ten years the sales of sheep amounted to 8,500, at from $1 50 to $2 50 per head.

In an account published by Hon. A. J. Dufur in the *Willamette Farmer* of the expenses and profit of running 1,500 three-quarters bred merino ewes, for one year, in Wasco county, salt is estimated at $20 per ton; hay at $10 per ton; straw at $5 per ton; shearing at 7 cents per head; wool-sacks at 62½ cents each; 1 herder and board for one year, $480; 2 extra men one month at lambing, $80; and he sells 13,500 pounds of wool at 22 cents per pound; 1,060 lambs at $2; 150 select lambs (rams) at $5; and he figures an income over expenses of about $1,871.

The estimated average value of Oregon sheep in 1880 was: Rams, $26; ewes, $2; wethers, $1 80; lambs, $1 50.

The estimated average live weight of mutton-sheep was 107 pounds; dressed weight, 57 pounds.

The estimated average wool clip among selected sheep per head was: Rams, 12 pounds; ewes, 6 pounds; wethers, 7 pounds; lambs, 5 pounds.

In certain flocks of Oregon sheep, aggregating, in 1880, as compiled from answers to circulars, 26,588 head, the composition was as follows: 127 rams, or about two-fifths of one per cent. of the whole; 10,830 ewes, or 41 per cent.; 9,350 wethers, or 35 per cent.; 6,281 lambs, or 24 per cent. Lambs dropped to each 100 ewes, 90; of these 58 survived to yearlings.

The average annual loss among adult sheep was 11.08 per cent., arising from the following causes: Disease, storms, wild animals, and poisonous plants.

SWINE.

The production of hogs in Oregon and Washington has attained as yet comparatively limited proportions, and has engaged a trifling amount of capital and attention when contrasted with the cattle and sheep husbandries; not even supplying their own home demand. The northwest depends largely at present upon the east for its preserved, cured, and salted meats, and its local resources will probably for some years continue to be inadequate in supplying the demand for pork. The wheat farmers of Oregon and Washington feed few hogs; they prefer to raise grain for sale in bulk. The conditions of markets and the difficulties of transportation have hitherto prevented the growth of hogs on any considerable scale outside the Willamette valley.

SLAUGHTERED.—According to Special Abstract No. 9, Manufactures, Tenth Census, nine meat-packing establishments in Oregon slaughtered during the fiscal year ending June 30, 1880, 5,809 beeves, valued at $126,102, with an average live weight of 1,196 pounds; 9,840 sheep, valued at $18,540, average live weight 114.3 pounds; 5,225 hogs, valued at $49,450, average live weight 281 pounds; with an aggregate value of all animals of $194,092.

There were 3,206,667 pounds of beef sold fresh and 710,750 pounds salted or cured; 558,000 pounds of mutton sold fresh; 158,750 pounds of pork sold fresh, 192,000 pounds salted; 561,250 pounds of bacon and hams; and 68,600 pounds of lard; an aggregate value of all products of $264,712.

ESTIMATED MOVEMENTS OF CATTLE AND SHEEP DURING THE YEAR 1880.

FROM OREGON. Destination.	Cattle.	Sheep.	INTO OREGON. Source.	Cattle.	Sheep.
To California	5,000		From California		5,000
To Nevada	12,000	5,000	From Washington	8,000	
To Washington	10,000	11,000			
To Montana	8,000	25,000			
To Idaho	16,000	6,000			
To Wyoming	58,300	15,000			
Total	109,300	62,000	Total	8,000	5,000

CATTLE, SHEEP, AND SWINE IN OREGON AS REPORTED FOR CERTAIN YEARS.

Year.	Authority.	Cattle.	Sheep.*	Swine.
1850	Seventh Census (on farms)	41,729	15,382	80,235
1860	Eighth Census (on farms)	154,131	86,052	81,615
1870	Ninth Census (on farms)	120,197	318,123	119,455
1880	Tenth Census (on farms)	416,242	1,083,162	156,222
1880	Tenth Census (on farms and estimated unenumerated ranch and range stock)	598,015	1,368,162	179,195

CATTLE, SHEEP, AND SWINE IN OREGON JULY 1, 1880.

Sections.	Sections defined.	Approximate acreage of available pasture.	Cattle.	Sheep.*	Swine.
Western Oregon	West of the Cascade mountains	12,000,000	148,844	511,873	137,659
Northeast Oregon	Wasco, Umatilla, and Union counties	12,000,000	152,362	724,987	32,573
Southeast Oregon	Lake, Grand, and Baker counties	21,000,000	294,737	130,743	8,364
Total available pasture		45,000,000			
Total, exclusive of those held by Indians			595,943	1,367,603	178,596
Held by Indians on reservation			2,072	559	599
Grand total			598,015	1,368,162	179,195

* See note to Texas tables, p. 31.

Total area of state ..... acres.. 60,518,400
Total population 174,768

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of neat stock the unit of stock, and considering five head of sheep to equal one head of cattle in consumption of pasturage, we have 45,000,000 acres available for 871,647 units of stock, or 51.63 acres to the head.

WASHINGTON TERRITORY.

PASTURE.

Till 1853 Washington was a part of Oregon, whose early history would include the early history of Washington.

WEST OF CASCADE MOUNTAINS.—Washington west of the Cascades is at present not adapted to cattle-raising, except for home supply. A few years ago it furnished some cattle to British Columbia. The country about Puget sound does not produce cattle enough for home consumption; the deficiency is supplied from east of the Cascades. Counting mountain parks and valleys, foot-hills and tide-lands, there are about 7,000,000 acres of pasture land in this region. Its character, however, is agricultural. The only suitable cattle ranges are the Cowlitz, Chehalis, Yelm, and a few other prairie pieces, besides rolling or rough stretches among the mountains. There is a belt of pasture averaging 9 miles in width from the mouth of the Columbia nearly up to the Cascades broken by mountain spurs. There is some good pasture around Shoalwater bay, in upper Pacific county, where the mildness and the moisture of the ocean keep the grass fresh throughout the year. Tide-land hay and hay of cultivated timothy furnish feed for bad seasons; the hill country furnishes a variety of browse. In Chehalis county there are about 40,000 acres of fair prairie grazing. In west Washington cattle are not held upon free range, but in connection with farming. For this very reason the occupation is denser than where herds roam for food. It seems to be true of both Washington territory and the state of Oregon that there is now no really first-class wild pasture, except in very small patches. Overstocking and other causes have worn it out.

EAST OF THE CASCADES.—STEVENS COUNTY.—This great county is so broken, mountainous, and timbered that only about two-thirds of it is pasturable, and most of that only for summer range, in scattered tracts of valleys and parks. The best of its grazing is northeast of lake Chelan, dying out over the Okinakane valley and along the Methou valley as they are lost in the mountains; also east of the Okinakane in broken pieces to the Columbia. The Colville Indian reservation occupies the region between the Okinakane and the Columbia, and in 1880 there were not 5,000 head of cattle in the country outside the reservation. Its pasture, considered in regard to grass alone, offers range for very many times that number could it be utilized, but lying as it does frequently in broken pieces of mountain and valleys difficult of access, dangerous for winter occupancy, and two-thirds of it being Indian reservations, it remains unoccupied. Stock in Stevens county is confined to the west side of the Okinakane and to a very small extent to the plateau north of the Spokane. A rough prairie of good bunch-grass extends toward the Colville valley,

but all the northern two-thirds of Stevens is bleak and mountainous. The southern half of the west Okinakane valley and the southern one-quarter of the north Spokane country are the only winter ranges in Stevens county.

YAKIMA AND KLIKITAT COUNTIES.—This section has an available pasturage of about 3,000,000 acres, but in Yakima county it is well eaten out. On the west are the mountains, which decrease to hills, extending over half the county, and then come more or less rough prairies to the Columbia. Klikitat is the most rugged of the two counties, with high divides and deep cañons. Stock formerly drifted to the country between the Yakima and Columbia rivers for summer range, and returned to the bottoms of the Topewash and Satas rivers in winter. Now so exhausted are the Yakima river ranges that they wander over the high plateaus in the eastern portion of the country in summer, and in early winter travel back to the Klikitat country. This reversion of former habit proves the exhaustion of the north Yakima pasturage. South Yakima, from east to west, along the north boundary of Klikitat, is a sage country. The poorest tract of the country is that bordering the Columbia. In the Simcoe mountains, the forests afford pine and bunch-grass pasture. The climate is hard, and though stock manage to subsist through the winters, the sources of nourishment are limited. Following up the Yakima is a stretch of sage, and the same growth is seen from Yakima to The Dalles, until one strikes timber on the Simcoe mountains. Along the running streams are found strips of hay claims, sometimes more than a thousand acres in a body; but reflecting that 500 head of cattle will eat a ton of hay in two days, the provision seems insignificant before the number of cattle and sheep that the two counties carry, which would consume in one month nearly 20,000 tons of hay if they were forced to subsist on that alone. (*a*) Pasture in its prevailing order is bunch-grass, sand grass, white and salt sage, greasewood, and browse. The broken hill ranges make good protection from storms. The mountains and the Columbia river are effective boundaries for stock. Fencing is becoming the rule in the valleys with the growth of agriculture, and the day of great stock ranging seems nearly finished except as it is carried on in connection with farming. Reckoning the available pasturage of the Yakima and Klikitat section of Washington as we did that of the western section, we find 43 acres of pasture to the unit of stock.

GREAT PLATEAU OF THE COLUMBIA, SPOKANE AND WHITMAN COUNTIES.—This section, included between the Spokane, the Columbia, and the Snake river, is the most important grazing portion of the territory when both extent and quality are considered. We find here the largest continuous areas of pasture, though it must be borne in mind that everywhere in this territory pasture is in broken areas; coulees, which are extensive dry water-courses, often wide and deep with precipitous, basaltic walls, run northeast from the Columbia, in the eastern portion of the territory; scab land, so called from the eruption in spots of the same basaltic foundation, shows itself in bare, dark patches along the coulees and in the tule lake regions of the northeast. The general topographical character of the great plain of the Columbia is rough, rising in elevation from the Columbia to the eastward. The quality of pasturage improves from the sand border of the great river past the margin of sage brush to good bunch-grass, well watered, east of the 119th meridian. Generally in eastern Washington, contrary to experience elsewhere, the poorest pasturage is found near the rivers. Belts of sand border the water-courses for miles. The southeast portion of Spokane and Whitman counties, or about one-fifth of the entire section of the great plain of the Columbia, comprising all that country bordering the Palouse river and its tributaries, is, perhaps, the best pasturage of the territory, but it is rapidly passing into the possession of farmers. Bunch-grass is here abundant.

The middle part of Whitman county, along the main Palouse and the higher country in the east, furnishes superior summer range, from which stock can pass in winter to the milder and drier pastures of western Whitman. We find in this section of Washington nearly 45,000 cattle and over 58,000 sheep, with about 8,000,000 acres of available pasturage, good, bad, and indifferent, or 141 acres to each unit of stock.

SOUTH OF THE SNAKE RIVER.—WALLA WALLA AND COLUMBIA COUNTIES.—The heavily timbered Blue mountains occupy the southern portions of these counties. Between the Snake and the Touchet rivers there is lack of water. With these exceptions, Walla Walla and Columbia have good pasturage, but the rapidly increasing farming interests have crowded out free range. The stock unit in Walla Walla and Columbia counties has but 19 acres of pasturage.

CATTLE-RAISING.

Below are presented the views and the methods of two practical cattle-growers, given in response to printed inquiries, and exhibiting in brief the general condition and methods of cattle-raising in Klikitat and Yakima counties at the time of the investigation:

KLIKITAT COUNTY.

My range extends north from the Columbia 100 miles, east and west 125 miles; other herds, however, occupy the same range. The western half of Klikitat county is well watered; the eastern half, above Elder creek, has good feed but scant water, except along the Columbia river, and feed is short near that stream. Cattle cannot reach the best feed for want of water. Grazing plants are bunch-grass principally; also rye grass and white sage. Larkspur (Monk's-hood?) is poisonous to cattle, but is not abundant. Land is held by pre-emption and homestead entries, and a good deal by first occupation merely. Very little land is purchased except for agricultural purposes, but stockmen respect each other's rights of range; that is, cattlemen do. Land is fast being pre-empted and homesteaded for agricultural purposes. This change will gradually drive all cattle from the country; large bands went out in 1880. The region is overstocked badly; cattle most numerous. My range is permanently injured by sheep. Number of cattle owned January, 1879, 5,009; number

a It is now known that in the winter of 1880–'81 unusual snows and exceptional severity compelled great dependence on cured feed, and very great losses occurred among live-stock for want of it.

of calves branded during 1879, 1,725; number of cattle sold during 1879, 500, loss 10 per cent. incurred during winter. Twelve thousand five hundred square miles of land free range government land; 160 acres of land owned, $1,600; buildings and fencing (two barns, house, and corrals), $2,000; equipments in wagons, harness, saddles, etc., $500; horses ($25 to $60 per head), $1,500; total value of plant, exclusive of cattle, $5,600.

The average composition of a herd of 5,000 just before the round-up was: Bulls, 100, average value each, $15; cows, 2,200, average value each, $12; steers, three years and upward, 500, average each, $20; two-year-olds, both sexes, 900, average value each, $12; yearlings, 1,300, average value each, $8. Steers are in great demand, and hence a small proportion are held by cattle raisers. One-half of the yearlings and two-year-olds are males. They run so near even that many stockmen keep the tally together and divide by two; one year with another it is an even thing. If properly cared for, a herd of cows will bring 75 per cent. increase. The number branded depends wholly upon one's vigilance. Some men will brand more calves than their cows number; others, of course, do not get all their increase branded. For the whole country, not over 60 per cent. of calves are raised to yearlings. Five men are regularly employed at $30 per month and board, $1,800, and one man at $40 per month and board, $480; cost of regular labor per annum, $2,280. My men are regular hands, and by riding constantly do all work required, no extra help being necessary.

Cattle drift by their own instinct from summer to winter ranges; they reach the winter range about the 1st of November, and leave it for the summer pasture-grounds in May. We do not use corrals, except in early spring, when we sometimes corral a bunch of cows to brand the calves, but very seldom. We rope calves and brand outside of a pen usually. We do not feed cattle at any season; we feed 12 saddle-horses; that is all. We have about 75 acres under fence for raising feed for our saddle-horses in winter, beside a horse-pasture. Young calves are castrated as soon as found; the younger the better; the younger they are altered the cleaner-horned steers they will make. We sometimes spay heifers. It is only profitable on an overstocked range. Loss from the operation about 7 per cent. One thousand head is the smallest number that can be run here. About 40 bulls to 1,000 cows are allowed. The high-bred bull should be brought in not older than a yearling, but does not get fully acclimated and useful until the second generation.

Cattle are never rounded up by a regular system on our range. We keep the same number of men riding the year round, and have the same force or "outfit" winter and summer. We have a very rough range, and in summer our cattle go back into the mountains where it is impossible to find all of them. We brand during the summer whenever and wherever we find calves, and those that we fail to find during the summer we catch in the fall and winter when they come down from the mountain range. Owing to the roughness of our country it is not suitable to round-up.

The weight and quality of cattle have improved by the importation of shorthorn bulls in about the same proportion that the ranges have decreased; if the stock had not been improved they would have decreased in weight and quality in the same proportion as the ranges filled up and began to fail. Shorthorn bulls have been brought into the country and renewed often. Their progeny have helped to improve our common stock. Shorthorn cattle will be run in small bands, and taken better care of. Running cattle in large bands in this country is fast getting to be a thing of the past. Hides are saved from cattle dying, or salted; beef-hides are worth about 18 cents per pound; murrain hides, one-third off. There is no sale for bones. Average native beef is worth 4 cents net weight per pound in Portland, Oregon. The average live weight of a three-year-old steer, range-fed, in best condition, is 1,250 pounds; net weight, 625 pounds.

I estimate the average percentage of losses among cattle over an average year to be: From disease, 1½ per cent.; winter storms, 5 per cent.; wild animals, ½ per cent.; snake-bites, 1 per cent.; thefts, 2 per cent.; poisonous plants, 2 per cent.; total loss, 12 per cent.

I estimate the average profit of the cattle business of five years, say, from December 31, 1875, to January 1, 1881, about 25 per cent. About one-half are returned for taxation. The proportion for each county depends much on rate of taxation; if taxes are high, one-third of cattle may be returned and taxed; if medium, one-half; if low, two-thirds; it depends, as elsewhere, largely upon the veracity of owners.

YAKIMA COUNTY.

My range is on the Yakima river, from Yakima City to mouth of the river, a distance of 100 miles, thence down the Columbia river 100 miles to Columbus, and embracing all the country between two rivers named in the triangular section described. We do not control individual stock-ranges, however, all herds ranging over same common territory, as it is impossible to keep different herds of cattle apart.

My range is poorly watered, and has a band of scabby sheep at every watering-place. There is a large tract of land north of Umatilla City, where, in certain seasons, there is no water; that makes a good winter and spring range for cattle which subsist on snow for drink, and where sheep never go.

The natural grasses and forage plants are rye-grass, bunch-grass, goose-grass, four or five varieties of slough-grasses, blue-joint, cane-grass, alfileria, willow, white sage, ross, greasewood, and broom-sage, besides rushes in wet land.

Land is held by pre-emption and homestead and by occupation; none of our lands are subject to cash entry; much of the Northern Pacific railroad land is occupied and will be purchased from the company when they offer it for sale. Only a small proportion of government land which is desirable for agriculture is held by simple occupation, as it has been generally surveyed and is subject to entry. Fencing land is the only way to exclude others.

Much of our bunch-grass land is proving valuable for wheat production, and is being rapidly taken up and settled. All arable land will thus soon be cultivated, and thus end the production of cattle on the open range.

The country is badly overstocked. Cattle have been most numerous, but now cattle-owners are running from a pestilence—sheep. Our ranges are permanently injured by sheep; they drive us out and ruin our ranges and business. They kill the grass; they poison the stock-water. There should be a United States law confining them to certain limits, from which they should not encroach upon cattle ranges and take the life out of the enterprise.

The composition of a herd of 5,000 just before the round-up was: Bulls, 130, average value each, $25; cows, 2,000, average value each, $12; steers, three years and upward, 370, average value each, $17; two-year-olds, both sexes, 1,100, average value each, $12; yearlings, 1,400, average value each, $7.

The above prices are for cattle sold in large bands. One-half the yearlings and two-year-olds are steers. About 72 per cent. of cows will drop calves.

Since 1867, when I embarked in the cattle business, I have never had a count on my herd. After getting my herd up to 2,000 head, I have endeavored to hold it to about that number, buying and selling each year. All purchases have been made within the territory, and all sales have been made to parties beyond the territory. My answers are therefore only approximate. Number of cattle owned January, 1879, 2,300; calves branded during 1879, 800; cattle sold during 1879, 2,000; cattle bought during 1879, 900; number of cattle owned January, 1880, about 2,000.

A general statement based on my business would be, for example, an investment of $50,000 in 5,000 cattle, and suppose them to occupy the range where my herd is. There are 5,000 square miles of free-range government land; 300 acres of land owned, worth $5,000; buildings and fencing (including corrals in different parts of the range), $1,200; horses for handling cattle, $1,600; brood-mares and stallion for breeding horses used in the business, $1,500; total estimated value of plant, $11,800.

We expect to brand about 66 per cent. of calves, *i. e.*, on the whole number of cows in our herd, including two-year-old heifers.

I pay four men, at $40 per month and board ($20 per month), $2,880; one man, at $60 per month and board ($20 per month), $960. Cost of regular labor per annum, $3,840. Ten men extra when sales are made, to help round up, for one month, $1 50 per day and board $450; ten men extra when cattle are fed in winter, for one month, perhaps, some seasons, at $1 50 and board, $450; total cost of extra labor per annum, $900.

No changes are made at present for summer and winter grazing. Our cattle used to be driven to the upper part of Yakima for summer grazing, but now too many "pilgrims" and "grangers" have settled in that country. Our cattle are corralled when the calves are branded, and some cattlemen wean their calves. Cattle are also penned to count and counterbrand them when a sale occurs.

Some parties prepare hay for feeding in winter; many do not. Those who do not have hitherto lost as few cattle as those who do. But now the range is too short to make it safe to own cattle without a ton of hay to every cow. Steers will live in an ordinary winter. Hay cut for feeding is generally wild hay; some wheat-hay is grown. No hay is now cut outside of inclosures, and will cost, not including interest on value of ranch, $3 per ton, *i. e.*, wild-grass hay.

If there is plenty of "browse-feed" in the inclosures where we put weak cows in winter, we would feed to 100 cows about 500 pounds of hay per day; usually we feed to this number 1,000 pounds.

We have 300 acres of meadow fenced, 150 acres of which is cut with a mowing-machine, and yields commonly 1½ tons of wild-grass hay to the acre. As we are not compelled to feed every winter, our stock of hay accumulates, and we are thus enabled, when it is necessary, to feed a large herd of cattle. But the great difficulty in this sort of provision is the impossibility of getting our stock to the hay when a hard winter does come, owing to deep-crusted snows, which prevent stock from being driven far. Many stock-raisers have claimed, therefore, with much correctness, that their loss during an occasional hard winter will not reach the great expense of maintaining a hay-ranch, and especially as they are liable to loss in any case from the probability of being unable to collect their cattle to feed them.

Calves are castrated when branded, and they are branded when found, even if not more than two days old. We have spayed heifers with good success. Cows so treated make the best beef, and are more hardy than any other stock we have.

The way cattle are handled on our range there is no use in a man having less than 1,000 head, unless he runs a dairy in connection with the other parts of the business. About 30 bulls are allowed to 1,000 cows. The high-bred bull should not be older than two years when brought here. Their half-breed descendants are as hardy as any of our cattle.

The work of branding begins about the 1st of May, when an outfit of a dozen men starts out with a wagon and cook, and camp near some corral on the range. The surrounding country is ridden over, and all stock handled and calves branded within reach, the branding pen being used to corral cows and calves in. After working all the range within reach, the outfit and wagon go to another corral, 10 or 20 miles distant, and proceed to handle all the stock in that neighborhood. Thus they go through the range where, at different points convenient to favorite pasture grounds of cattle and to good water, corrals have been located for branding. Many calves are necessarily missed, and when these leave their mothers, or are weaned naturally, they are called "slick-ears", "sleepers," or "mavericks", and belong to any cattleman who can get his brand on them. In the spring men go out "slick-earing" with lassos and branding-irons on their saddles and secure such calves. The animals are roped and the iron put on, having been heated over a fire of sage-brush or cow-chips. This sort of business has proved the most profitable branch of the enterprise to some cattle-raisers, as they brand more calves than their cows number.

While quality is much improved, weights and values have much depreciated, owing to short range and surplus of supply over demand. Cattle used to sell for $40, but now they sell by the herd at $10. Improvement in quality has occurred by the importation of shorthorn bulls and cows. Stock will be improved by shorthorn blood; but improvement of cattle with us does not seem to pay.

Hides of slaughtered cattle are saved. Cattle that die of disease, old age, etc., are skinned, if found, but hides do not pay for the labor. Beef-hides are worth 15 cents at the Dalles, Oregon. Bones are not utilized. Beef brings an average of 2 cents gross in the Dalles and Portland, Oregon, the only markets for our section. One thousand one hundred pounds is average live weight of a three-year-old range-bred steer; 600 pounds net weight.

In an average year estimated loss from disease, none before 1880, but this year, 2 per cent.; from winter and spring storms, 10 per cent.; from thefts, 2 per cent. from poisonous weeds, 2 per cent.; total loss, 16 per cent.

In many instances men have lost large sums of money in this business; in other cases cattle-raisers have cleared 33 per cent. profits in five years. About 60 per cent. of cattle in territory are taxed.

The composition of the 21 herds of Washington cattle, aggregating 10,400 head in 1880, was as follows: 208 bulls, or 2 per cent. of the whole; 4,888 cows, or 47 per cent.; 1,144 beeves and three-year-olds, or 11 per cent.; 1,872 two-year-olds, or 18 per cent.; 2,288 yearlings, or 22 per cent. The number of calves dropped to each 100 cows was 85; of these 62 survived to yearlings.

The estimated average annual loss among cattle over twelve months old was 14.05 per cent., made up from disease, storms, wild animals, poisonous plants, and other causes.

The estimated average value of Washington cattle in 1880 was: Bulls, $28; cows, $12 50; three-year-old steers, $19; two-year-olds, $12 50; yearlings, $7 75; calves, $4 75; beeves, $22.

The estimated average weight of a three-and-a-half-year-old grass-fed steer in Washington was, live weight, 1,150 pounds; dressed weight, 585 pounds.

EXPORTS OF NEAT CATTLE, BY CUSTOMS DISTRICTS, FROM 1870 TO 1880, INCLUSIVE.

[Compiled by Joseph Nimmo, esq., and furnished by the National Bureau of Statistics.]

Years.	Number.	Value.	Years.	Number.	Value.
PUGET SOUND.			PUGET SOUND—continued.		
Total for eleven years	13,322	$407,227	1875	1,073	$23,487
			1876	1,240	25,150
1870	1,467	80,865	1877	611	11,931
1871	1,016	57,765	1878	543	9,678
1872	1,079	48,325	1879	176	3,573
1873	2,439	76,243	1880	57	1,434
1874	3,621	68,776			

SHEEP.

In the southeast section of Washington territory, *i. e.*, in the counties of Walla Walla and Columbia, south of the Snake river, we find nearly half the sheep of the entire territory. The authorities drawn from are Messrs. Asa Le Grow, Preston Brothers, L. B. Greer and Lucky.

With the exception of some animals that may possibly have entered west Washington from the Oregon importation of Mr. Lease, who sold to the Hudson Bay Company and to Bishop Blanchet, of the Catholic mission, in 1838 or 1839, the sheep husbandry in Washington territory does not date back more than twenty years. Sheep came from the Willamette valley and eastern Oregon in the footsteps of cattle-pioneers and in the van of farming settlements. In 1869, S. M. Wait, now of Dayton, Washington territory, drove in from Umatilla county, Oregon, about 5,000 head. Others soon followed from California and Oregon. The route of the drive is through Umatilla, across the Snake river up to Crab creek, Big lake, Wilson creek, and the Four lakes; in the west from the Willamette region it is mainly over the military road, by way of Oregon City, Mount Hood, Deschutte's Bridge, Leonard's, Pendleton, and Weston, to Walla Walla and onward. The number coming in is now very small, principally of American merino rams brought from California and from Vermont; also to some extent southdown, Leicester, and cotswold. The original stock were the so-called "native" Oregon sheep, bred up from the California sources to merinos. The sheep driven from Washington territory are taken to Montana, very few being left in Idaho. The trail is over the Mullan road in the north and the stage route in the south, by the way of Baker City, Union, and Boisé City.

In the interval from December 25 to the 1st of the following November the rams are held in flocks separate from the rest of the sheep, and sometimes fed grain preparatory to service. They run with the ewes from November 1 to Christmas time. Lambing is in April and May. Shearing is in May and June. The wethers are separated from the main flock as lambing approaches, and at weaning time the lambs are separated from their mothers.

In winter the flocks are generally close-herded, where there are both shelter and feed. Some hay is stacked for severe weather and they are corralled at night. During summer, until the grass of the plains dries up, they range at large, a herder with each flock. The shearing finished and the prairie pasture exhausted, they are driven to the mountains. From the country south of the Snake, they are generally changed to the north side into the Crab creek, Big lake, and Deep lake region, and brought back in November. Sheds are not used.

Scab is very prevalent south of the Snake river and is the only troublesome disease. The losses are mainly in consequence of scarcity of feed, winter exposure, and wild animals. When sheep are fed, about one pound of hay and one-quarter pound of barley are allowed per day to each head. The value of the hay averages $8 per ton and barley 1 cent per pound.

Mutton can be sold for the immediate home demand, and where transportation is cheap because of short, easy drives, or convenient low freight, it goes toward the Sound markets or to those of the lower Columbia. The main object is wool. In 1875 the average price of wool in the territory was 12½ cents on the shearing ground. It was classed "coarse", and a fleece weighed 1½ pounds less than in 1880, when it was called medium and averaged 20 cents.

In certain flocks of Washington sheep, in 1880, aggregating 5,944 head, there were: 44 rams, or nearly 1 per cent. of the whole; 3,413 ewes, or 57 per cent.; 1,024 wethers, or 17 per cent.; 1,463 lambs, or 25 per cent. The number of lambs dropped to each 100 ewes was 80; of these 43 survived to yearlings.

The estimated average annual loss among adult sheep was 12 per cent.

The average increase among flocks in Washington was stated by flock-owners to be 70 per cent. in favorable years. The disastrous experience of sheep-owners during the winter of 1879–'80, however, has greatly lowered this average rate of increase. (*a*)

The following statement is given as indicating prices of stock, labor, etc., at the time of this investigation, as far as they go, exempt from special or peculiar losses:

STATEMENT OF A SHEEP BUSINESS IN WALLA WALLA, WASHINGTON TERRITORY.

EXPENSES.

Started with 1,000 head of stock sheep, at $2 50, bought during October	$2,500 00
Put up 20 tons hay, at $10	200 00
Corral sheds, etc	200 00
Herder, $600, including board, and one extra man for lambing and shearing time, $150	750 00
Dogs	25 00
Shearing, at 7 cents	70 00
Packing wool, $20; 25 wool-sacks, 40 fleeces to the sack, at 75 cents, $18 75	38 75
Incidentals, such as changing ranges, etc	75 00
Pasturing rams during season	30 00
Ten rams	400 00
Salt	25 00
Add 7 per cent. loss on 1,000 sheep	175 00
Total expenses first year	4,488 75

a The winter of 1880–'81 is reported as even more calamitous than that of 1879–'80.

RECEIPTS.

600 pounds wool, at 18 cents	$1,080 00
375 lambs, at $2	750 00
125 wethers sold for mutton, at $1 50	187 50
Shearers' board, six men six days, at 75 cents	27 00
Total receipts first year	2,044 50

SECOND YEAR.

EXPENSES.

25 tons hay, at $10	$250 00
2 herders, at $600	1,200 00
Extra labor	100 00
Horses, $200; wagon, $140; harness, $40	380 00
Tools, etc	10 00
2 rams, $80; pasturing same, $40	120 00
Repairs to corrals, sheds, etc	75 00
Changing ranges	75 00
Salt	30 00
Incidentals	50 00
Shearing 1,262 head, at 7 cents	88 34
Shearers' board	36 00
Grain for horses, etc	100 00
Wool-sacks, $24; packing wool, $20	44 00
Moving wool, etc., $7 50 per ton	26 00
Allow 7 per cent. loss on sheep from all causes	325 00
Total expenses second year	2,909 34

RECEIPTS.

8,203 pounds wool	$1,476 34
500 new lambs	1,250 00
Sales of mutton, 200 head	300 00
Total receipts second year	3,026 34

In certain flocks of sheep in Washington territory the average values during 1880 were: Rams, $30; ewes, $2 25; wethers, $1 50; lambs, $1 50. The average weight of mutton-sheep was: live weight, 100 pounds; dressed weight, 55 pounds.

The average wool-clip was: Rams, 12 pounds; ewes, 6 pounds; wethers, 7 pounds; lambs, 5 pounds.

The probabilities are that these special flocks show an average higher than that of the territory.

The number of live stock exported from the customs district of Puget sound, Washington territory, during 1880, was 57 cattle, valued at $1,434; 4,755 sheep, valued at $9,755; and 1,049 swine, valued at $8,006. Stock not designated were imported to the amount of $414.

ESTIMATED MOVEMENT OF STOCK: 1880.

Destination.	FROM WASHINGTON.		Source.	INTO WASHINGTON.	
	Cattle.	Sheep.		Cattle.	Sheep.
Total	101,500	15,000	Total	10,000	18,500
To Montana	11,000	15,000	From Oregon	10,000	11,000
To Oregon	8,000		From California		7,500
To Idaho	10,000				
To British possessions	500				
To Wyoming	72,000				

CATTLE, SHEEP, AND SWINE IN WASHINGTON TERRITORY AS REPORTED FOR CERTAIN YEARS.

[Washington was part of Oregon previous to 1860.]

Year.	Authority.	Cattle.	Sheep.*	Swine.
1860	Eighth Census (on farms)	28,459	10,157	6,383
1870	Ninth Census (on farms)	47,254	44,063	17,491
1880	Report of territorial supervisors to Tenth Census enumerated on farms	134,554	292,883	46,828
1880	Tenth Census (on farms and estimated unenumerated ranch and range stock)	198,184	388,883	48,074

* See note to Texas tables, p. 31.

CATTLE, SHEEP, AND SWINE IN WASHINGTON TERRITORY, JULY 1, 1880.

Divisions.	Approximate acreage of available pasture.	Cattle.	Sheep.*	Swine.
West of the Cascade mountains	7,000,000	56,461	68,675	24,993
Stevens county	6,000,000	4,974	372	739
Yakima and Klikitat counties	3,000,000	55,098	74,046	5,591
Columbia, Plateau, Spokane, and Whitman counties	8,000,000	44,689	61,079	6,184
South of the Snake river: Walla Walla and Columbia counties	1,300,000	29,892	184,192	9,300
Total available pasture	25,300,000			
Total, exclusive of those held by Indians		191,114	388,364	46,807
Held by Indians on reservation		7,070	519	1,267
Grand total		198,184	388,883	48,074

*See note to Texas tables, p. 31.

Total area of territory.....acres.. 42,803,200
Total population of territory..... 75,116

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of neat stock the unit of stock, and considering 5 head of sheep to equal 1 head of cattle in consumption of pasturage, we have 25,300,000 acres available for 275,961 units of stock, or 91.68 acres to the head.

IDAHO TERRITORY.

HISTORY.

The early history of Idaho is blended in that of Oregon, of which it formed part until 1853, when it was included in Washington territory. In 1863 Idaho was made a separate territory. Fort Hall was established in 1834 as a trading-post, and certainly as early as 1836 was a stopping-place for emigrants to the Oregon coast accompanied by cattle, and from time to time other emigrants passed over the same route. A few cattle were held there from those early days.

PASTURAGE.

NORTH OF THE SOUTH FORK OF SNAKE RIVER AND EAST OF THE MEDICINE LODGE MOUNTAIN.—This region was almost untried up to 1880 as a stock range, because of danger from Indian depredations. Its practicability as a winter range may yet be considered doubtful. Before 1880 the only settlers in this region were in isolated localities on the Montana stage route, or on favored hay spots of the Snake river.

Previous to the penetration of the Utah and Northern railroad (spring of 1880) it was a wild and little known region. During the winter of 1879–'80 two ranges were started, one in Garden Grove on Henry's fork, the other near Camas. During 1880 another ranch was located some 15 miles northeast of Camas town on Camas creek. In October, 1880, there were rich and extensive ranges of upland summer grazing, but apparently very restricted winter pasture. In the winter of 1879–'80 1,300 cattle occupied the sand-hills range east of Camas, about 25 miles long and 20 wide, comparatively free of snow. Some of the cattle ranging beyond the east limits of the sand-hills into the old Crater hills suffered severely. The others, occupying the heart of the sand-hills, fared better. The sand-hills furnish bunch and sand grass, the latter of which, bearing a nutritious black seed, is very abundant in the valleys. During the winter of 1879–'80 this range was the resort of elk, blacktail deer, antelope, and a band of moose. This indicates the impracticability of pasturing cattle during severe seasons in the upper country, for of all the deer tribe the moose is best able to feed where snows cover the ground. South and west of the sand-hill range to Market lake and the Snake, and to the sinks of Birch and Medicine Lodge creeks, there is extensive winter range, but inferior to the sand-hills, as sage takes the place of grass in part; shelter is scanty and snow lies longer. In the lower country of Camas creek and Henry's fork, and on Dry and Beaver creeks, the grass was found (October, 1880) badly eaten off by sheep that had passed through from California to Montana, leaving only scattered patches of white sage.

The quality and quantity of the grasses are good north of latitude 42°. The kinds of grasses are: sand grass, abundant among the sand-hills; bunch of two kinds, on higher levels; white sage and black sage; blue-joint, not

common; duck-grass, prevailing in meadows; rye-grass, growing near water; wild blue-grass and red-top, tall and plentiful in the meadows about the sources of all creeks. The natural meadows of Camas creek and Henry's fork produce grasses high and abundant.

A settler on the Camas meadows reported that he cut 200 tons of hay which he sold at the railroad-construction camp on Beaver cañon. He said that he could have secured 1,000 tons.

On Camas, Beaver, Dry, and Medicine Lodge creeks, lava croppings constantly appear, the streams wearing their courses through the rocks, sometimes falling into the box cañons in high falls. Cattle can nevertheless find access to the water.

The southeastern corner of Idaho, next the Yellowstone park, is very sparsely grazed. Cattle have not yet been wintered there in great numbers. At the time of investigation about 3,500 cattle were in the vicinity of Market lake in an area of about 5,000 square miles, four-fifths of which is good grazing, with abundance of water. There are barren spots here and there, and just before the foot-hills of the great divide are reached isolated peaks and buttes break the general level of pasturage. Strips of low timber generally border the streams. In the cañons and on the mountain slopes red fir, cedar, quaking aspen, and a variety of pines are found.

In winter a few cattle feed between the Medicine Lodge mountains (the local name for the southeastern spurs of the Salmon river mountain) and Market lake (about longitude 112°) and west of the sand-hills.

At the headwaters of Camas creek, 40 or 50 miles northeast of Camas town, the snow lay 4 feet deep for a time during the winter of 1879–'80. The only settler there, with 24 head of cattle and 8 head of horses, for which he had put up little hay, lost most of his stock. The altitude is greater than that of the sand-hills.

Captain Augustus H. Bainbridge, Fourth Infantry, commanding at fort Hall, has gathered a knowledge of the Teton basin during hunting trips. It is a favorite feeding-ground for large game, but it could never be relied on as a winter range. Phillips, an old mountaineer, who had hunted and prospected there during the spring of 1880, said that only the moose remained in the basin during the winter. He reported that the tender twigs of the willows, black birch, and quaking aspen along the streams were nipped by the moose to the height of 12 and 14 feet, which indicated that the snow lay to the depth of from 4 to 8 feet. Phillips asserted that even elk and blacktail deer could not live in the Teton basin during an average winter, and that during the summer and autumn young stock would suffer greatly from the bears. Captain Bainbridge represented the basin as about 50 miles long by 15 wide, an unoccupied range of good summer pasture. From his mapping-notes has been gained much knowledge of the pasturage in that part of Idaho east of longitude 112° and north of latitude 42° 30′.

The capabilities of northern Oneida county as a summer range are good aside from such elevated ranges as the Teton basin. It can probably support 50,000 head of stock during summer, but the greater part is unsafe for cattle during winter. The sand-hills, the only safe range through the ordinary winter, cannot support more than 5,000 head.

ONEIDA COUNTY, SOUTH OF THE SOUTH FORK OF SNAKE RIVER.—The cattle in this section are generally trail stock, merely wintering and then passing eastward. The exceptions are south and southeast of Bannock creek. The winter ranges are restricted to an average 12-mile border of Snake river and to a piece of 100 square miles north of the great bend of Bear river, though stock in mild seasons may graze into the foot-hills of the eastern and southern mountains. The trail herds are removed previous to the time of summer grazing. The only herd of any consequence grazing on the Indian lands, fort Hall reservation, is one of 2,500, which pays a fee of 30 cents per head. This pasturage is uniformly good, especially in the renowned fort Hall bottoms. It is probable that some of the 10,000 cattle turned loose between Blackfoot and Eagle Rock must have drifted upon the reservation before the early winter storms of 1880. In lower Oneida, especially about the head of Rock creek, there is good grazing permanently occupied, though the winter range is limited. A growing settlement has begun fencing largely, and thereby restricts the water facilities. The southeast corner of Oneida county is more or less occupied by Mormon settlers who have long tilled the soil, with small herds under fence, not dependent upon open range. The heavy losses of the winters of 1879–'80 (as well as 1880–'81) were owing entirely to unusually severe weather, and not to overstocked pastures. The grasses of its hills and mountains are bunch and sand, the former abundant, the latter limited. On the bottom lands are the blue-joint, red-top, and wire grasses, all plentiful over the fort Hall reservation, while the bunch, sedge, tule, and rye grasses constitute the prevailing pasturage elsewhere. The capacity of the fort Hall reservation pasturage, with its 150 square miles of luxuriant bottoms, could not be affected by the Indian stock of about 900 cattle and 2,000 horses, but the trail cattle of outsiders drifting down in winter have, during the seasons of 1879 and 1880, materially diminished it as well as the sage-brush bench between the reservation and the foot-hills.

The sheep of Oneida county decreased in 1880, owing to the losses in the severe winter of 1879–'80 and the consequent removal of many flocks. (*a*)

a Two such winters in succession, 1879–'80 and 1880–'81, in Oneida county, northwest of Bear lake and between latitudes 42° 25′ and 43° 40′, caused the average loss on trail cattle of 40 per cent., and on range cattle 15 to 18 per cent. With sheep, during the first winter, there was a like average loss of 40 per cent. Our reports of the same stock, during the winter of 1880–'81, are insufficient for representation. Both stocks in Bear Lake county seem to have escaped the losses so disastrous north of it.

CASSIA COUNTY.—In proportion to its area this county is comparatively heavily stocked. For a number of years it has held some large herds, and in regard to the proportions of summer and winter grazing is a favorable stock region. It has suffered since 1876 from overstocking. Water privileges are often fenced, particularly along Raft river and Goose creek. Descending northward to the extensive sage-bush plain of Snake river we come to excellent winter range, occasionally restricted by snow and arid patches. In traveling over these plains in October, 1880, tracts of abundant bunch and sand grass were seen among the sage untouched by stock, because of want of water.

The bottoms of Raft river are noted for tall rye grass, while the basin supports a vigorous growth of greasewood. White sage is plentiful on the benches. There are found occasionally, even in the summer country proper of southeast Cassia county, as in the fort Hall reservation, tracts which may be called winter parks, where sweet sage, white sage, greasewood, and willows—all or some of them—occur near warm springs, and furnish nourishment and shelter for small herds of stock.

Cassia county lies on the north side of the divide between Salt lake and Snake river and seems fully stocked, at least for winter. Adjacent to the Snake it is a vast plain, slightly rolling and intersected by streams, sometimes roughly ridged by mountain spurs. Across it, east and west, stretches a sage tract, commencing in the fort Hall reservation and reaching to Stein's mountain in Oregon.

The grasses cut on the river bottoms are mainly rye and red-top, with some blue-joint. On Dry creek and in parts of Marsh basin the settlers have domestic timothy and red-top over small areas. The native upland grasses are those of the other pastures of Idaho.

The sheep of Cassia county were, in 1880, only two flocks: one on Raft river, the other on Goose creek. The winter of 1879–'80 was disastrous; the loss estimated at 20 per cent. on trail animals and 10 per cent. on range stock.

Cassia county sends many beeves to the country east of Idaho. Several thousand were sent southwest to California via Humboldt's wells during 1880, mostly from the herds of one man. He controls the herds of Goose creek, and has secured titles to the land for 20 miles above and below his ranch on Salmon Fall river.

The ranges of the county are well supplied with well-bred bulls, and the stock is generally of good quality, originally mainly Oregon stock, with some Texas cows in 1870 to 1874.

OWYHEE COUNTY.—Although the stock occupation of this county did not begin until 1867, it was fully stocked about 1874 or 1875, and has since then deteriorated. Beside the almost everywhere repeated fact in Idaho of abundant summer range and very restricted winter pasturage, at certain seasons herds from Baker county, Oregon, and Elko county, Nevada, have been pastured here, which do not appear in Owyhee tax-returns. The summer grazing areas are in the hills at the heads of the many streams emptying into the Snake, the Owyhee, and the Bruneau. The winter pasture is along the Snake river and in the foot-hills back of that river; also on what is called the Bruneau "desert" east toward the Cassia line, and on the Owyhee desert in the southwest, about the forks of the Owyhee river. The country east from Sinker creek, along the Snake, extending 20 miles beyond the mouth of the Bruneau, has been considered a fine winter range, because of the abundance of white sage and greasewood, but prolonged and heavy grazing and the accustomed trail of Oregon and Washington stock over this pasturage have impaired it. West of Sinker creek to the mouth of the Owyhee, along Reynolds and Squaw creeks, sheep have helped to consume the pasture. Two permanent flocks, aggregating 10,000, are held on those creeks, and during the winter of 1879–'80, 10,000 additional sheep on the trail from California to Oregon rested on the same ranges. The most experienced stockmen thought that the business of open-ranging of cattle must soon cease.

The cattle of Owyhee county are exceptionally good, and it is the general practice to use well-bred bulls on the range.

The grasses are essentially the same as those in Ada and western Alturas counties.

In northern Owyhee, farmers, both whites and Chinamen, are coming in to plant, fence, and irrigate. The stockmen unite in a general "rodeo" in the spring.

LEMHI COUNTY.—Lemhi is a mountainous, mining county, bounded east by the mountain divide. One-third of its extent may permit summer grazing, but the amount of winter pasture is small and fully occupied. The springs are late and cold and the winters are severe.

Since 1870 the county has produced its own supply of beef. In 1875 it first sent cattle out. Beside bunch-grass, there are the sages (sweet, white, salt, and prickly). The sweet, white, and salt sages blossom in July and ripen in August and September, but are not eaten until after heavy frosts. The county held 18,040 cattle and 718 sheep in 1880.

NORTH OF SNAKE RIVER, BETWEEN THE RIVER AND THE LAVA BEDS, EXTENDING FROM MARKET LAKE TO THE MALADE AND LITTLE WOOD RIVERS.—This range of about 1,100 square miles is isolated from theft and from "trailers", and its natural boundaries of lava-beds and rivers are effectual barriers to straying. Its entire occupation in 1880 was about 14,000; two herds of which numbered 3,000 each, another 2,800, and five others averaged something over 1,000 each, in round numbers. Snow never lies long. The winter loss is usually small. Half of the ranch required a journey of several miles to and from water, and the pasturage is overstocked, especially along the river border, where cattle will remain during summer.

There is good grass close up to the lava, and there is meadow opposite the fort Hall bottoms. The country is generally a plain of uneven surface, broken into gulches and cañons toward the river all the way below the fort Hall meadows and on the outskirts of the lava limits. Bunch and sand grass prevail with some white sage and greasewood. The irregularity of the country with the outcroppings of lava in the north furnish ample shelter; nevertheless the winter of 1879–'80 brought losses estimated at 18 per cent.

The bulls used are of a good class. One firm has brought in some *Herd-Book* shorthorns. Beef goes to the fort Hall agency, to Blackfoot, and to drovers *en route* to Wyoming.

Of sheep the only flocks in the range described are: One at Market lake, the other close to the mouth of the Malade.

CAMAS PRAIRIE, ALTURAS COUNTY.—This is an elevated basin south of the Saw-tooth mountains. It is about 40 miles by 12, with luxuriant grass and well watered by numerous small streams that overflow in the spring and renew the naturally rich bottoms. Its whole surface is closely and strongly sodded on a black loamy soil, bearing chiefly the bottom grasses, red-top, blue-joint, and others. It is the summer grazing ground of Ada county herds that have wintered on the Snake river, west of the mouth of the Malade. They push up to the prairie about the middle of May. Eight to ten thousand stock cattle pastured on the prairie during the summer of 1880. The stockmen best acquainted with the capacities of the range asserted that it could carry 40,000, or that between 7 and 8 acres would fully feed one head of cattle. The locality is a favorite place for trail drivers to halt their stock and recruit on the way from Oregon and Washington eastward, yet this heavy use did not seem to have materially affected the resources of the range.

Until 1880 it was claimed by the Bannocks as a hunting ground. Now three settlers, each having about 100 head of cattle, have located there, encouraged by the presence of the Wood river mining camps on the eastern extremity. Persons having knowledge of the region say that large herds cannot safely winter on the range. The settlers had cut hay and were prepared to feed their comparatively small herds. On the Camas hills to the north we were assured that there were areas of the genuine curly buffalo-grass, such as is known in Montana and Wyoming; also heavy growths of bunch-grass. Those hill pastures have been very lightly stocked. The summer herds have kept on the prairie south of the trail.

No sheep are held on Camas prairie, though 50,000, tallied by Mr. Peck as they passed his camp on Big Camas creek, were driven through to Montana in 1880. Horses are probably the only domestic animals that could stand the winter without hay or grain.

The most abundant grass is red-top, with blue-joint and wild clover on the inundated bottom lands. Cattle grazed on this luxuriant prairie are reported frequently to dress 650 to 700 pounds. Only such numbers can be kept as can be safely provided with hay in winter.

The name "Camas" is derived from the camas plant (*Camassia esculenta*), for the bulbous root of which are claimed wonderful fattening properties.

Two or three hundred hogs are taken upon the Camas prairie for summer pasture, and for a month after fed on grain, corn, or peas, previous to slaughter, as the camas roots impart a bitter taste to the pork.

BIG AND LITTLE WOOD RIVER RANGES.—Above the foot-hills the valleys of these rivers are not suitable even for summer range. Below the foot-hills, though pasturage is rich and plentiful, dangers from Indians and severe winters have deterred all but casual occupation. A small herd of cattle passed the winter of 1879–'80 without hay on the little Wood river, but the fall of snow there that season was very light. There are some fine hay bottoms on the main Wood river well grassed with blue-joint, red-top, and broad-leaf. All the mountain streams of this region overflow in the spring and enrich meadows above the lava formation. Below latitude 43°, as in the forks between little Wood, Malade, and Snake rivers, white sage and greasewood are plentiful. On the Malade, about 8 miles above its confluence with the Snake, there is a considerable meadow from which about 300 tons of rye-grass and red-top hay are cut annually. Above latitude 43° stock-raising, except as connected with farming settlements, cannot be expected. The first attempt of sheepmen in Alturas county, east of the 115th meridian, is at Sand springs, near the Snake river, where a flock of 6,000 is located.

In addition to Camas prairie, there is a large area of country from the Malade river to beyond the Boisé river with a large proportion of safe winter ranges.

Since 1864, when a drover from California came into this part of Idaho with 300 head of cattle, it has constantly increased its neat stock until 1879. Before 1879 its marketable stock supplied the local demands of western Idaho, and went southward, but its pasturage has been overstocked since 1876, and in 1879 the surplus was disposed of in large numbers for the eastern trail. In 1880 it was carrying all the stock that safety permitted. In addition to local stock, the trail cattle annually reduces the pasturage of its hill districts. Most of the streams marked on the maps as running from the hills to the Snake river are generally dry during the hot weather, except near their sources. In this section there is much arable land, and along the heads of the streams and in the vicinity of the stage road it is irrigated, and produces hay, grain, and vegetables. Small herds of stock are held summer and winter in inclosed areas.

East of Boisé river open range still maintains itself, as the original settlers holding the claims came there as stockmen. Formerly the white sage, with intervals of greasewood, made abundant winter grazing along the Snake river below King Hill creek. The white sage has diminished.

A concise description of the general character of the whole country south and southwest of the Boisé river and the mountains to the Snake river may be thus given: The hill country of summer occupation still preserves good pasturage; as it ascends, the rolling surface grows rugged, but is generally accessible to stock and is everywhere well watered; the plains, comprising three-quarters of the entire region, present the usual treeless topography; their stream beds are, as a rule, dry during the summer; sometimes they are cañoned or washed out into rough flats by the spring floods, but there are seldom on these plains any extensive bottom lands, though some meadow has been made by a direction of the overflows and by the sowing of domestic grasses. Just below the mouth of Rattlesnake creek, about 600 acres beneath the wall rock of the Snake river produce 400 tons of hay annually. The pasturage of the plains has been injured by overstocking.

The number of sheep held is smaller than in 1876. Fencing is not general, and except in a very few cases is restricted to small areas. Timber is scarce and freight for other fencing materials, such as barbed wire, is high. The quality of cattle is good, the parent stock being generally from Montana and Utah, though the traces of California blood are sometimes seen. Blooded bulls have not been introduced except in rare cases. Local markets take all the beef. The custom with these drovers is to buy by "classes" according to age. The prices ruling in 1880 were: Yearlings, $7 to $8; two-year-old steers, $13 to $14; two-year-old heifers, $11 to $12; young cows, $12; three-year-old steers, $18; and beeves, $22 to $23.

WASHINGTON, ADA, AND BOISÉ COUNTIES—THE PAYETTE AND WEISER RIVER COUNTRY.—Along the Payette and Weiser rivers the country is rolling and broken, with narrow valleys. Up to 1877 it furnished winter and summer grazing, both very good; but the settlements made on the valley lands within three years by farmers from Oregon and from the eastern states, and the use of the remaining open range of the bottoms by Ada county stockmen have materially reduced or crowded the winter pasturage, though there is still ample summer range. Several cattlemen on the Payette hold from 2,500 to 3,000 head each, and one owner on the Weiser has 1,500 head. The change going on is well indicated in the view expressed by some cattle-owners, who herd on open range. They said:

> These poor immigrants who come into a homestead grant with a plow and a pair of horses and a dozen head of cattle, perhaps, and set about "bothering" the ground, and fencing, are ruining the country for us stockmen; they squat in the valleys which constitute our winter pasture and there turn out their small bands of stock in summer to eat it off, for they must keep them at hand as they can't afford to drive them to the hills; their fences, though they conform to the law, are insufficient to bar out our rough cattle when they come down in the fall, and we are held for damages; and they "dog" our stock so as to have the range for themselves; the result is that where years ago we could drive fat cattle from the range in any month of the year, we cannot now kill a fat beef.

The broken character of the country affords good shelter almost everywhere, and the climate is favorable, because the storms are not often attended by high winds, and the snow is so light that sleighing is almost unknown below the higher valleys. There are severe rains in April and October.

The grasses are bunch and rye in the hill country, and, on the winter grounds, rye, red-top, wire, broad-leaf, with the browse-feed of greasewood, black and yellow and white sage, buffalo brush, and willow.

Coyotes and occasionally gray wolves and bears cause some loss of stock, and poison weed infests certain localities.

DRIVES.

Until about 1863 Idaho was more of a highway than a terminus, except in the extreme southeast corner, where the Mormons located with Utah cattle in small herds in 1854 and 1855.

In 1863 Corder drove 300 Spanish cattle into western Idaho, and I. O. Shirley, in 1864, located in Oneida county, near fort Hall, with a herd he had driven from San Luis Obispo county, California. The winter following was one of great severity and almost all the Corder cattle perished.

In 1865 Jeffries brought cattle into the Weiser river country from Umatilla county, Oregon. Later, Governor Bradley, of Nevada, ranged a large herd on Snake river, in Cassia county.

In the autumn of 1866 a drove of about 800 steers from Texas was brought into the present Lemhi county, but these cattle were moved, in the spring of 1867, to Montana. Early in 1867 several small herds of from 25 to 100 head each, principally dairy cows, came into Lemhi county. Beef cattle were driven in from Montana during 1867, 1868, and 1869, and a few herds of stock cattle.

In 1868 I. O. Shirley drove in Texas cattle bought in Abilene, Kansas.

In 1869–'72 some large herds came from Utah and California to Thomas Hildreth, I. Herrold, and others, and were located south of the Snake river. By further drives and natural increase the ranges of Idaho were fully stocked in 1875. The first drives from Idaho to the east occurred in 1876. No Texas cattle have entered Idaho since 1874.

Blackfoot, near fort Hall, being a point of the Northern or Snake river trail, we were able there to learn the figures of important drives. One authority figured $1 50 per head as the cost, in 1880, of moving 4,800 cattle from one range to another on Snake river, a distance of 300 miles. Another driver of extensive experience on the

Oregon and Cheyenne trail made the expense to be $2 50 to $2 75 per head from Walla-Walla to the fort Hall reservation, and through to Laramie plains or Cheyenne $3 25 to $3 75, these figures being calculated on a herd of 1,800. Other authorities ranged from $3 to $4 per head for an average herd of 1,500 to 2,000, traveling 1,200 miles.

To drive 2,500 cattle 500 miles one man furnished as needful, 11 men at $1 50 per day each, 22 horses, 2 yoke of oxen, 1 wagon, 1 tent, 11 saddles, cook and mess outfit, shovel, pick, ax, a rifle to each man, and provisions at a cost of 75 cents per ration a day. Some use more horses.

The average value of cattle on the range in Idaho was said to be, for native bulls, $30, improved, $45; for native cows, $12, improved, $16; for three-year-old native steers, $18, improved, $21; for two-year-old native steers, $14, improved, $17; for two-year-old native heifers, $12, improved, $15; for native yearling steers, $8, improved, $12; for native yearling heifers, $7, improved, $10; for native calves, $5, improved, $7; and for native beeves, $23, improved, $26.

From statements of cattle-raisers throughout the territory the average live weight of three-and-a-half-year-old native steers was estimated to be 1,100 pounds; dressed weight, 575 pounds; improved stock, live weight, 1,160 pounds; dressed weight, 615 pounds.

The composition of 10 herds of cattle actually investigated, numbering 48,170 head, was 674 bulls, or 1 per cent. of the whole; 16,378 cows, or 34 per cent.; 5,299 three-year-old steers and beeves, or 11 per cent.; 7,226 two-year-olds, or 15 per cent.; 8,477 yearlings, or 18 per cent.; 10,116 calves, branded in 1879, or 21 per cent.

Stock-owners gave the average annual percentage of loss of cattle over twelve months old for a term of years, from disease, 0.5 per cent.; from winter and spring storms, 2 per cent.; from snake-bites and wild animals, 0.5 per cent.; from theft, 1 per cent.; from poisonous weeds and alkali, 1 per cent.; total average annual loss, 10 per cent.

In the extraordinary inclement winter of 1879–'80, the severest since 1863–'64, the estimated loss among cattle was said to be 17 per cent. (*a*)

SHEEP.

The sheep of Idaho came from Oregon, Utah, Nevada, and California, and a few breeding rams from the eastern states, but the number of sheep from all sources is small. The only movement has been that of trail droves from the states above mentioned to Montana and Wyoming.

Sheep enter Idaho from Umatilla county, Oregon, having crossed the Blue mountains from the upper waters of the Umatilla river to the northwestern fork of the Grande Ronde river, which they then follow down to Union; thence south to the headwaters of Powder river and up to a point about due east of Baker City; there they strike south to Burnt river, following it down and crossing the Snake into Idaho at Old's ferry, whence the trail runs up Snake river, past Weiser bridge and the Weiser river, to the stage-road, which it follows across Payette river to the Boisé valley, or, leaving Burnt river about half-way down, they go to the mouth of the Malheur river and cross the Snake on the ferry and go up the Payette river to the state road where it joins the other route described. Others reach the same point by crossing the ferry at the mouth of the Powder river; thence, if destined for Montana, the sheep are taken south of Boisé city through the valley and along the edge of the foot-hills, or through them to Little Camas prairie and thence through Big Camas across the Malade, Big Wood, and Little Wood rivers north of Emigrant Buttes, part of the sinks of Bog and Little Lost rivers, and Birch and Medicine Lodge creeks to Camas, whence the Montana wagon-road is followed across the mountains just east of Beaver cañon. If the aim is Wyoming, the sheep cross into Idaho at the mouth of the Owyhee and go up the Snake river or southern trail. This route can be followed while snows might in places obstruct the northern route. From the Camas prairie trail, sheep for Wyoming follow the Malade river to the Snake river route whence they cross by way of Soda Springs to Green river.

From California, the drive is across Esmeralda county, Ralston desert, Big Smoky valley, Monitor valley, Pine valley, and Ruby valley, to Humboldt's wells, and thence down Thousand Springs valley to Goose creek, following that into Idaho and then crossing to Raft river; follow that and keep across the Camas prairie trail, if bound for Montana; but if for Wyoming, then, leaving Raft river, pursue the southern route and eastern as described above.

The first kinds or breeds of sheep to stock Idaho, at least in the west, were the long-wooled Shropshire, Leicester, and southdowns, all with a trace of Spanish merino, and coming from Oregon. In the east, about Bear lake, they were from Utah, a mixture of sheep from the states and Mexican breeds, brought in by the Mormons; but in both cases the merinos predominated.

No Idaho sheep now leave the territory, and the comparatively large exit of late years is that only of sheep traveling through from the west and southwest to the east.

Stock sheep on the trail, grazing as they move, will average 12 miles per day. Wethers will travel from 12 to 15 miles. Mr. Haley says he had driven sheep from California to Oregon at an average rate of 16 miles per day; and on several occasions he had driven wethers 30 miles per day. Sheep with young lambs cannot journey more than 8 or 9 miles each day.

The average composition of a flock of 5,000 sheep on the 1st of January would be about 50 rams, 2,450 ewes, 1,000 wethers, and 1,500 lambs, half the latter being females and half males. The above breeding ewes

a According to information received during the preparation of this report, the winter of 1880–'81 was more favorable.

should drop from 2,400 to 2,800 lambs, of which 80 per cent. should survive weaning. Mr. Haley reported he had raised in one instance 1,516 lambs from 1,500 two- and three-year-old ewes. In these flocks, flock-masters think that the nearer the ewes approach the thoroughbred merino type the less frequently do they produce twins Among coarse sheep of three and four years old, 50 per cent. of the ewes will drop twins. With seven-eighths merino ewes, not over 10 or 15 per cent. will have twins.

Mr. Haley, who has at times held 15,000 sheep, owned but 5,000 in 1880. At the time of this investigation, he was employing two men through the year at a cost of $45 each per month, including board. For shearing he paid 6 cents per fleece, the shearers clipping 30 fleeces per day, though some first-class hands would clip 45. With long-wooled sheep, there were men who could shear from 50 to 90 per day. The custom is to divide the stock permanently into flocks of about 1,500 for health and facility in herding. Large flocks scatter, and when thus exposed suffer loss from eagles, coyotes, mountain lions, and wild cats.

About June, when the streams dry, the sheep push further into the hills to find water and fresh pasturage. In winter they come down to the lower rolling and open ranges. These changes are gradual; from May to July and from September to November.

The only corralling is for shearing, dipping, or tallying. Blooded rams have sheds within a pasture, where they are held during winter storms, and for about six weeks of feed before service, when oats and roots, beets or turnips are fed to them. Hay is fed to lambs and ewes when snow lies long—a rare occurrence. The best rams are taken from the flock in the morning and fed until turned in again at night; others run with the flock for six weeks. Hay, costing $3 to put up, is worth from $8 to $10; straw stacks, $2 50 per ton. The latter is poor feed if long continued, as it is constipating. Grown sheep will eat 3 to 3½ pounds of feed per day; lambs, 1½ to two pounds. Rams use 1½ pounds of oats, and about the same weight of roots, with 3 pounds of hay. Hay is cut from fenced claims, and wheat in the dough, to cure for winter use.

Rams run with the ewes from November 15 to January 1. Lambs come from April 1 to May 1. Shearing is from the middle of May to June 1. The lambing season is early in western central Idaho, but the practice has its risks. The advantage sought is to have good-sized lambs to kill, and to secure strength for those that are to be wintered. Castration is performed when the lambs are two weeks old. Fifteen hundred sheep are as few as can be economically run, as this number can be herded, dipped, etc., and the wool freighted with but small extra cost over that required for 1,000.

No desert-land entries are made, but small farmers are steadily and rapidly taking up homestead and pre-emption claims, while no large claims, save two, are owned and fenced in Ada county; one of 600 acres is on the Big Bottom of Snake river.

It is difficult to say how many acres of average grazing are required in western central Idaho to keep 1,000 head of sheep through the year, because the ranges of rolling and broken country are so unequal. With large flocks the aim is to move camp frequently, and thus secure a succession of fresh pasturage, never remaining long enough on one range to injure it. With 15,000 sheep Mr. Haley formerly occupied about 600 square miles of country, or over 25 acres to each head.

Sheep, few as they now are, are less in number than they were some years ago. Western central Idaho is stocked by cattle and horses beyond the capacity of its winter grazing. Settlers are occupying the bottom lands, restricting free range.

Merino rams from Vermont are bred to Oregon long-wooled Shropshires, cotswold, and Leicester. With fair care in winter the Vermont rams stand the change of climate and habit. The majority of flocks bred in Idaho are three-fourths to seven-eighths merino.

In 1875 Mr. Haley's shear per head averaged 5½ pounds; now (1880) he shears 7 pounds. His rams average 18 pounds; ewes, 7¼ pounds; wethers, 8 pounds; lambs, 7 pounds. Sheared pelts are worth from 12 to 15 cents; unsheared from 50 cents to $1, according to season. The average dressed weights of his sheep are: Two-year-old wethers, 50 pounds; three-year-old wethers, 60 pounds; four-year-old wethers, 65 to 75 pounds. Boisé City butchers pay 5 cents per pound, dressed. Mutton-sheep can be profitably transported only by drive as yet.

The obstacles to successful sheep-husbandry in the western portion of the territory are the presence of animals and birds that prey upon the sheep, both young and old; storms early in April and late in October, followed by severe cold, while the wool is saturated with moisture; restrictions of the ranges, and the distance from market. The average percentage of losses from all causes in the sheep husbandry of western central Idaho is estimated to be 15 per cent., of which 5 per cent. is from storms and 10 per cent. from wild animals and dogs.

Wool is shipped east, part by San Francisco, part directly east from Kelton, and from Ogden, Utah.

The estimated average value of Idaho sheep is: Rams, $25; ewes, $2 35; wethers, $2 75; lambs, $2. The estimated average live weight of mutton-sheep is 105 pounds; dressed weight, 53 pounds.

The estimated average fleece is: Rams, 13 pounds; ewes, 5½ pounds; wethers, 6¾ pounds; lambs, 4½ pounds.

In an average term of years the annual loss from disease among sheep over twelve months old was 2 per cent.; from winter and spring storms, 4 per cent.; from wild animals, 3 per cent.; from poisonous weeds and snake-bites, 1 per cent.; average total annual loss among adult sheep, 10 per cent.

MOVEMENT OF CATTLE.

In 1880 cattle were driven into Idaho from Oregon and Washington territory. The small number of 220 head entered the territory by the Utah and Northern railroad, and 1,360 went from the territory to Utah by the same conveyance. Shipments exceeded the receipts by 30,140 head. A portion of the cattle sent into Wyoming were shipped thence by the Union Pacific railroad for Chicago for slaughter, or to Iowa and Nebraska as "feeders".

MOVEMENT OF STOCK IN 1880.

From Idaho.	Destination.	Cattle.	Sheep.	To Idaho.	Source.	Cattle.	Sheep.
Total		56,360	20,000	Total		26,220	7,200
By drives	To Nevada	*5,000		By drives	Oregon	16,000	6,000
By drives	To Wyoming	50,000		By drives	Washington	10,000	
By drives	To Montana		20,000	By rail	Utah	220	1,200
By rail	To Utah	1,360					

* These cattle were beeves, driven chiefly from some of the southern counties to stations on the Central Pacific railroad for shipment to California.

ESTIMATED CATTLE, SHEEP, AND SWINE IN IDAHO TERRITORY AS REPORED FOR CERTAIN YEARS.

Year.	Authority.	Cattle.	Sheep.*	Swine.
1854	Mormon settlers of Bear Lake county	200	500	
1860	Old residents of Boisé valley	2,000	3,000	
1870	Ninth Census (on farms)	10,456	1,021	2,316
1880	Tenth Census (on farms)	84,867	27,326	14,178
1880	Tenth Census (on farms and estimated unenumerated ranch and range stock)	191,157	117,326	21,627

* See note to Texas tables, p. 31.

ESTIMATED CATTLE, SHEEP, AND SWINE, AND ACREAGE OF OCCUPATION IN IDAHO TERRITORY JULY 1, 1880.

Sections.	Sections defined.	APPROXIMATE ACREAGE OF STOCK OCCUPATION.		Cattle.	Sheep.*	Swine.
		Cattle.	Sheep.			
	Total	29,000,000	3,100,000	191,157	117,326	21,627
Northern	North of north boundary of Washington, Boisé, and Alturas counties	6,000,000	300,000	52,184	22,970	9,319
Central	South of above line and north of Snake river and Henry's fork	10,000,000	200,000	54,523	31,308	8,019
Southern	South of Snake river and Henry's fork	13,000,000	2,600,000	84,450	63,048	4,289

* See note to Texas tables, p. 31. Indian stock is included in above.

Total land area of territory	acres	53,945,600
Total area of approximate available pasturage	do	35,500,000
Total area of unoccupied available pasturage	do	6,500,000
Total population		32,610

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of neat stock the unit of stock, and considering five sheep to equal one head of cattle in consumption of pasture, we have 214,622 units of stock occupying 29,000,000 acres, or 135 acres to the head.

FLORIDA.

Florida has a large trade in cattle, whose sole feeding to the time of sale has been upon uncultivated pasture. This trade began about thirty years ago. The statistics of the export by sea by fiscal years from 1870 to 1880, inclusive, are given below, as taken from the reports of the Bureau of Statistics, United States Treasury Department:

Year.	Number.	Value.	Average value.	Year.	Number.	Value.	Average value.
Total	165,669	$2,446,846	$14.77	1875	11,663	$181,990	$15.58
				1876	8,549	113,912	13.32
1870	6,404	74,796	11.68	1877	9,081	120,364	13.25
1871	7,171	98,102	13.68	1878	16,242	221,528	13.64
1872	17,712	291,691	16.47	1879	25,466	346,300	13.60
1873	17,008	278,244	16.36	1880	28,607	400,615	14.00
1874	17,746	319,304	17.99				

The denser settlements of Florida are in the northern part. The southern part of Florida is very sparsely settled, and contains the famous Everglades, as yet little utilized for any purpose.

It is estimated that, July 1, 1880, over 62 per cent. of the cattle of Florida were in the peninsula south of the 30th parallel, and that at least 300,000 of the cattle of the peninsula and over 60,000 of the cattle in northern Florida depended entirely for forage upon uncultivated pasture.

About 80 per cent. of the whole number marketed beyond the state are shipped by sea, by way of Key West, to foreign countries. The stock is raised in a section respecting which there is little popular information, and which is seldom visited. The seclusion of the inhabitants of southern Florida interested in cattle-grazing is such and the difficulties of penetrating to the interior ranges is so great, that this report contemplates only the general outlines of the business.

The census returns of live-stock on farms show, June 1, 1880, 16,141 working oxen, 42,174 milch cows, and 409,055 other cattle; 56,681 sheep, not including spring lambs, and 287,051 swine. To these, estimates for range stock would add: Cattle, 91,025; sheep, 49,000; and swine, 28,549; making a total of 168,574.

It is probable that of the 409,055 "other cattle" "on farms" at least 75 per cent. subsist entirely on the forage of open range. There is no exact dividing line between the wholly nomadic herds with no established home quarters and the farm stock wholly kept on the farms. Owners of farms frequently own considerable herds grazing on open range either near or remote. In some cases the farmer has returned the stock which he owned without separating that which was on the farm. In other cases the owner of a farm has stock interest predominating to such a degree as to entitle him to be counted as a ranch-man. In the transitional condition of frontier life some of these difficulties of classification are inevitable.

South of the 29th parallel, that is, in the really wild grazing portion of the state, embracing the counties of Hernando, Sumter, Orange, Hillsborough, Polk, Brevard, Manatee, and Monroe, where farming occupies no more in proportion to the area than it does in New Mexico or in Idaho, it is estimated that four-fifths of the cattle range at will, with only wild feed. Of the entire live-stock of Florida, it is estimated that not over 40 per cent. were strictly held upon farms. There were but little over 16 per cent. of the sheep of the state in the peninsula. In the northwest 54 per cent. were held west of the Apalachicola river. Next in density is that part of the Suwanee basin from Bradford county to Madison county, inclusive. In southern Florida northern Sumter has the densest occupation.

The open ranging of cattle in southern Florida doubtless dates back to the Spanish occupation; and the stock has descended from Spanish sources, but the sheep appear to be derived from stock brought in from states farther north, and more or less graded to merinos. Except in the hill country of the northwest and elsewhere above the peninsula, the coarse forage, the wet surface, and the tangled vegetation are unfavorable to sheep either for mutton or for wool.

It is estimated that throughout the state, if none were slaughtered and there were no losses except from natural causes, the proportion of lambs to the total flocks about July 1 would be 19 per cent., or a yearly increase of not quite 23.5 per cent., but in the best districts of northern Florida the lambs will often reach 23 per cent., making about 30 per cent. increase.

In a case reported from Escambia county, a sheep-owner with a flock of about 2,000 head on a range of 300 sections (square miles) shared with 6,000 other sheep—about 24 acres to the head—had marked 580 lambs up to July 1, 1880, and sheared 1,550 adult sheep. His lambs, therefore, amounted to over 26 per cent. of all his sheep, and gave an increase of 37 per cent. This, however, seems an exceptional year's experience.

The estimates for cattle are made upon such inadequate data as to render them more unreliable, but, according to the best attainable information, calves in 1880 were about 18.25 per cent. of the total herds, making an increase, as compared with the herds of 1879, of 22.32 per cent.

The ordinary range beef of southern Florida is the descendant of Spanish stock, small and scrawny, averaging about 750 pounds when shipped. A better class of stock in the northern part of the peninsula and in the counties adjacent to Georgia and Alabama, finds market in the towns of southeastern Georgia. Some are pastured for a time to fatten for better beef on the southwestern wire-grass and pine lands of Georgia. Within a few years cattle-grazing has been attempted with small numbers, and promises good results. Most of the present supply of good beef for the cities and winter resorts of northern Florida is brought from beyond the state. Florida steers of two to three years old can be bought for $12 to $14 a head. They can be grazed to advantage on the south Georgia savannas, where lands are as cheap comparatively as the grazing tracts of Kansas and Nebraska. Fed with the corn of central Georgia they would furnish excellent beef.

Small and thin as are the native range cattle of Florida, the meat is tender and well flavored. The long and abundant mosses of the hummocks and other timber growths contribute sustenance, of which, however, an animal requires a great quantity as compared with the nutritious grasses of the best farm districts of the United States. The beeves from Florida, although each weighs on an average a hundred-weight less than one from Texas, are preferred, pound for pound, as meat in Cuba. The Florida animals are also gentler than the Texas beeves, and bear transportation better, at least for the short journey to Cuba.

During 1878, 1879, and 1880, Florida exported more neat cattle by sea than Texas, and the Florida cattle realized 60 cents more per head during the decade between 1870 and 1880 than Texas cattle. Here, again, the advantage of nearness to market may have had its influence.

Lassoing, line-riding, and other usages of western practice are unknown in Florida cattle-raising. Branding is generally done by contract by a class of men called "agents", who are paid by the head for the calves branded. Cows and calves are gathered in pens for this purpose, and the calves are caught by hand to brand and ear-mark. When required for the Cuba market, which is mostly in the winter, the owner drives them to the shipping port. The business is simple and comparatively direct.

ESTIMATED MOVEMENT OF CATTLE, SHEEP, AND SWINE IN 1880.

	Destination.	Cattle.	Sheep.	Swine.
Total		29,858		219
By drive	Georgia and Alabama	1,500		
By railroad	Consignees, by Atlantic, Gulf and West India Transit railroad	3,000		
By sea	New Orleans and Cuba	25,358		219

There were no records of drives, and the number given has only the authority of a rough estimate, after careful inquiry. The shipments by rail are estimated for 1880, basing the estimate on the returns of the road for 1878–'79. The shipments by sea are derived from customs records.

CATTLE, SHEEP, AND SWINE IN FLORIDA AS REPORTED FOR CERTAIN YEARS.

Year.	Authority.	Cattle.	Sheep.	Swine.
1850	Seventh Census	261,085	23,311	209,453
1860	Eighth Census	388,060	30,158	271,742
1870	Ninth Census	390,915	26,599	158,908
1880	Tenth Census (enumerated on farms)	467,370	56,681	287,051
1880	Tenth Census (enumerated on farms and estimated unenumerated ranch and range stock)	558,395	105,681	315,600

ESTIMATED CATTLE, SHEEP, AND SWINE IN FLORIDA JULY 1, 1880.

Approximate acreage of stock occupation:		
Cattle	acres	26,000,000
Sheep	do	15,000,000
Stock:		
Cattle	number	558,395
Sheep	do	105,681
Swine	do	315,600
Total land area of state	acres	34,713,600
Total population		269,493

AVERAGE DENSITY OF STOCK (CATTLE AND SHEEP) OCCUPATION.—Making one head of cattle the unit of stock, and considering five sheep to equal one head of cattle in consumption of pasture, we have 579,531 units of stock occupying 26,000,000 acres, or 44.86 acres to the head.

GENERAL STATISTICS.

CATTLE, SHEEP, AND SWINE, INCLUDING ANIMALS ENUMERATED ON FARMS, AND ESTIMATED UNENUMERATED RANCH AND RANGE STOCK IN DESIGNATED GRAZING REGIONS.

States and Territories.	Cattle on farms.	Estimated ranch and range cattle.	Estimated total cattle.	Sheep on farms.*	Estimated ranch and range sheep.*	Estimated total sheep.*	Swine on farms.	Estimated ranch and range swine.	Estimated total swine.
Total	9,478,987	3,750,022	13,229,009	12,356,518	7,000,000	19,356,518	6,207,742	2,090,970	8,298,712
Arizona	44,983	90,774	135,757	76,524	390,000	466,524	3,819	4,630	8,449
California	664,307	150,737	815,044	4,152,349	1,575,000	5,727,349	603,550	264,869	868,419
Colorado	346,839	444,653	791,492	746,443	345,000	1,091,443	7,656	3,229	10,885
Dakota	140,815	65,968	206,783	30,244	55,000	85,244	63,394	2,316	65,710
Florida	467,370	91,025	558,395	56,681	49,000	105,681	287,051	28,549	315,600
Idaho	84,867	106,290	191,157	27,326	90,000	117,326	14,178	7,449	21,627
Indian territory	(†)	487,748	487,748	(†)	55,000	55,000	(†)	773,931	773,931
Kansas	1,451,057	82,076	1,533,133	499,671	130,000	629,671	1,787,969	86,274	1,874,243
Montana	172,887	255,892	428,279	184,277	95,000	279,277	10,278	4,912	15,190
Nebraska	758,550	354,697	1,113,247	199,453	48,000	247,453	1,241,724	377,178	1,618,902
Nevada	172,221	44,602	216,823	133,695	97,000	230,695	9,080	85	9,165
New Mexico	166,701	181,235	347,936	2,088,831	1,850,000	3,938,831	7,857	10,302	18,159
Oregon	416,242	181,773	598,015	1,083,162	285,000	1,368,162	156,222	22,973	179,195
Public lands;		58,450	58,450						
Texas	4,084,605	810,093	4,894,698	2,411,633	1,240,000	3,651,633	1,950,371	499,252	2,449,623
Utah	95,416	37,239	132,655	233,121	290,000	523,121	17,198	3,423	20,621
Washington	134,554	63,630	198,184	292,883	96,000	388,883	46,528	1,246	48,074
Wyoming	278,073	243,140	521,213	140,225	310,000	450,225	567	352	919

* See note to Texas tables, p. 31. † Not enumerated. ; Region north of the Panhandle of Texas, not included in any state or territorial government.

CATTLE, SHEEP, AND SWINE, INCLUDING ANIMALS ENUMERATED ON FARMS, AND ESTIMATED UNENUMERATED RANCH AND RANGE STOCK, BY STATES AND TERRITORIES.

States and Territories.	Cattle on farms.	Estimated ranch and range cattle.	Estimated total cattle.	Sheep on farms.*	Estimated ranch and range sheep.*	Estimated total sheep.*	Swine on farms.	Estimated ranch and range swine.	Estimated total swine.
Total United States	35,925,511	3,750,022	39,675,533	35,192,074	7,000,000	42,192,074	47,681,700	2,090,970	49,772,670
Alabama	751,190	.....	751,190	347,538	.....	347,538	1,252,462	.....	1,252,462
Arizona	44,983	90,774	135,757	76,524	390,000	466,524	3,819	4,630	8,449
Arkansas	708,243	.....	708,243	246,757	.....	246,757	1,565,098	.....	1,565,098
California	664,307	150,737	815,044	4,152,349	1,575,000	5,727,349	603,550	264,869	868,419
Colorado	346,839	444,653	791,492	746,443	345,000	1,091,443	7,656	3,229	10,885
Connecticut	236,886	.....	236,886	59,431	.....	59,431	63,699	.....	63,699
Dakota	140,815	65,968	206,783	30,244	55,000	85,244	63,394	2,316	65,710
Delaware	53,552	.....	53,552	21,967	.....	21,967	48,186	.....	48,186
District of Columbia	1,567	.....	1,567	.....	.....	.....	1,132	.....	1,132
Florida	467,370	91,025	558,395	56,681	49,000	105,681	287,051	28,549	315,600
Georgia	909,911	.....	909,911	527,589	.....	527,589	1,471,003	.....	1,471,003
Idaho	84,867	106,290	191,157	27,326	90,000	117,326	14,178	7,449	21,627
Illinois	2,384,322	.....	2,384,322	1,037,073	.....	1,037,073	5,170,266	.....	5,170,266
Indiana	1,363,760	.....	1,363,760	1,100,511	.....	1,100,511	3,186,413	.....	3,186,413
Iowa	2,612,036	.....	2,612,036	455,359	.....	455,359	6,034,316	.....	6,034,316
Kansas	1,451,057	82,076	1,533,133	499,671	130,000	629,671	1,787,969	86,274	1,874,243
Kentucky	843,794	.....	843,794	1,000,269	.....	1,000,269	2,225,225	.....	2,225,225
Louisiana	470,601	.....	470,601	135,631	.....	135,631	633,489	.....	633,489
Maine	334,421	.....	334,421	565,918	.....	565,918	74,369	.....	74,369
Maryland	262,540	.....	262,540	171,184	.....	171,184	335,408	.....	335,408
Massachusetts	261,051	.....	261,051	67,979	.....	67,979	80,123	.....	80,123
Michigan	891,631	.....	891,631	2,189,389	.....	2,189,389	964,071	.....	964,071
Minnesota	659,050	.....	659,050	267,598	.....	267,598	381,415	.....	381,415
Mississippi	717,335	.....	717,335	287,694	.....	287,694	1,151,818	.....	1,151,818
Missouri	2,080,932	.....	2,080,932	1,411,298	.....	1,411,298	4,553,123	.....	4,553,123
Montana	172,387	255,892	428,279	184,277	95,000	279,277	10,278	4,912	15,190
Nebraska	758,550	354,697	1,113,247	199,453	48,000	247,453	1,241,724	377,178	1,618,902
Nevada	172,221	44,602	216,823	133,695	97,000	230,695	9,080	85	9,165
New Hampshire	232,405	.....	232,405	211,825	.....	211,825	53,437	.....	53,437
New Jersey	223,886	.....	223,886	117,020	.....	117,020	219,069	.....	219,069
New Mexico	166,701	181,235	347,936	2,088,831	1,850,000	3,938,831	7,857	10,302	18,159
New York	2,339,721	.....	2,339,721	1,715,180	.....	1,715,180	751,907	.....	751,907
North Carolina	657,426	.....	657,426	461,638	.....	461,638	1,453,541	.....	1,453,541
Ohio	1,860,186	.....	1,860,186	4,902,486	.....	4,902,486	3,141,333	.....	3,141,333
Oregon	416,242	181,773	598,015	1,083,162	285,000	1,368,162	156,222	22,973	179,195
Pennsylvania	1,730,237	.....	1,730,237	1,776,598	.....	1,776,598	1,187,968	.....	1,187,968
Rhode Island	35,584	.....	35,584	17,211	.....	17,211	14,121	.....	14,121
South Carolina	363,709	.....	363,709	118,889	.....	118,889	628,198	.....	628,198
Tennessee	783,674	.....	783,674	672,789	.....	672,789	2,160,495	.....	2,160,495
Texas	4,084,605	810,093	4,894,698	2,411,633	1,240,000	3,651,633	1,950,271	499,252	2,449,523
Utah	95,416	37,239	132,655	233,121	290,000	523,121	17,198	3,423	20,621
Vermont	403,105	.....	403,105	439,870	.....	439,870	76,384	.....	76,384
Virginia	686,184	.....	686,184	497,289	.....	497,289	956,451	.....	956,451
Washington	134,554	63,630	198,184	292,883	96,000	388,883	46,828	1,246	48,074
West Virginia	458,444	.....	458,444	674,769	.....	674,769	510,613	.....	510,613
Wisconsin	1,129,141	.....	1,129,141	1,336,807	.....	1,336,807	1,128,825	.....	1,128,825
Wyoming	278,073	243,140	521,213	140,225	310,000	450,225	567	352	919
Public lands†	.....	58,450	58,450	.....	.....	.....	.....	.....	.....
Indian territory†;	.....	487,748	487,748	.....	55,000	55,000	.....	773,931	773,931

* See note to Texas tables, p. 31. † Not enumerated in the census. ; No separate estimate for stock on farms.

SUMMARY SHOWING CATTLE, SHEEP, AND SWINE OF THE UNITED STATES, JULY 1, 1880.

	Cattle.	Sheep.*	Swine.
The United States	39,675,533	42,192,074	49,772,670
Total on farms in thirty-one states and territories, including District of Columbia	26,446,524	22,835,556	41,473,958
On farms in grazing states and territories	9,478,987	12,356,518	6,207,742
Estimated unenumerated ranch and range stock	3,750,022	7,000,000	2,090,970

*See note to Texas tables, p. 31.

EXPORTS OF CATTLE, SHEEP, AND HOGS, AND THEIR PRODUCTS FROM THE UNITED STATES TO FOREIGN COUNTRIES FOR FISCAL YEARS 1871–1880, INCLUSIVE.

[Compiled from reports of the bureau of statistics.]

Year.	Neat cattle.		Average value.	BEEF PRODUCT.					
				Fresh beef.		Meats preserved.		Salted or cured.	
	Number.	*Dollars.*	*Dollars.*	*Pounds.*	*Dollars.*	*Pounds.*	*Dollars.*	*Pounds.*	*Dollars.*
1871	20,530	403,491	19 65					43,880,217	3,825,666
1872	28,033	365,719	13 05					26,652,094	1,870,826
1873	35,455	695,957	19 63					31,605,196	2,447,481
1874	56,007	1,150,857	20 53					36,036,537	2,956,676
1875	57,211	1,103,085	19 28	48,243,251	4,197,956		735,112	48,243,251	4,197,956
1876	51,593	1,110,703	21 53	36,596,150	3,186,304		998,052	36,596,150	3,186,304
1877	50,001	1,593,080	31 86	49,210,990	4,552,523		4,547,319	39,155,153	2,950,952
1878	80,040	3,896,818	48 69	54,046,771	5,009,856		5,102,625	38,831,379	2,973,234
1879	136,720	8,379,260	61 29	54,025,832	4,883,080		7,311,408	36,950,563	2,336,378
1880	182,756	13,344,195	73 02	84,717,194	7,441,918		7,877,200	45,237,472	2,881,047

Year.	Live sheep.		Average value.	SHEEP PRODUCT.		Live hogs.		Average value.
				Fresh mutton.				
	Number.	*Dollars.*	*Dollars.*	*Pounds.*	*Dollars.*	*Number.*	*Dollars.*	*Dollars.*
1871	45,465	86,888	1 91			8,770	61,390	7 00
1872	35,218	79,592	2 26			56,110	584,153	10 41
1873	66,717	107,698	1 61			99,720	787,402	7 90
1874	124,248	159,735	1 29			158,581	1,625,837	10 25
1875	124,416	183,898	1 48			64,079	739,215	11 38
1876	110,312	171,101	1 55			68,044	670,042	9 85
1877	179,017	234,840	1 31	349,368	36,480	65,107	699,180	10 74
1878	183,995	333,499	1 81	130,582	9,272	89,284	267,259	9 13
1879	215,680	1,082,938	5 02	1,440,197	123,013	75,129	700,262	9 32
1880	209,137	892,647	4 27	2,335,858	176,218	83,434	421,089	5 05

Year.	HOG PRODUCTS.				LARD.	
	Number of pounds of bacon and hams.	Total value of bacon and hams.	Number pounds of pork.	Total value of pork.	Number of pounds.	Total value.
1871	71,446,854	$8,126,683	39,250,750	$4,302,320	80,037,297	$10,563,020
1872	246,208,143	21,126,592	57,169,518	4,122,304	199,651,660	20,177,610
1873	395,881,737	35,022,137	64,147,461	5,007,035	230,534,207	21,245,815
1874	347,405,405	33,383,908	70,482,379	5,808,712	205,527,471	19,308,019
1875	250,286,549	28,612,613	56,152,331	5,671,495	166,869,393	22,900,522
1876	327,730,172	39,664,456	54,195,118	5,744,022	168,405,839	22,429,485
1877	460,057,146	49,512,412	69,671,894	6,296,414	234,741,233	25,562,065
1878	592,814,351	51,752,068	71,889,255	4,913,657	342,766,254	30,022,133
1879	732,249,576	51,074,433	84,401,676	4,807,568	326,658,686	22,856,673
1880	759,773,109	50,987,023	95,949,780	5,930,252	374,979,286	27,920,367

NOTE.—Other neat-animal products not included in foregoing statistics: Tallow, butter, cheese, condensed milk, wool, neat's-foot oil, candles, hides, leather, soap, hair, and bones.

EXPORTS OF CATTLE, SHEEP, AND HOGS AND THEIR PRODUCTS FROM THE UNITED STATES TO FOREIGN COUNTRIES.

The summaries herewith compiled from the reports of the bureau of statistics give total values for exports of cattle, sheep, and hogs, their meat product and lard, but do not include their other products of tallow, butter, cheese, condensed milk, wool, neat's-foot oil, candles, hides, leather, soap, hair, and bones.

Four points in the progress for twenty years are presented for comparison.

1861.

	Average value.		Value.	
8,885 live cattle,	$25 12,	and beef, salted or cured	$2,897,570	
—— live sheep,	——		28,417	
463 live hogs,	7 05,	and bacon, hams, and pork	7,461,424	
		Lard	4,729,297	
				$15,116,708

1870.

27,530 live cattle,	15 98,	and beef, salted or cured and preserved	2,693,522	
39,570 live sheep,	2 40		95,193	
12,058 live hogs,	15 73,	and bacon, hams, and pork	9,566,003	
		Lard	5,933,397	
				18,288,115

1875.

57,211 live cattle,	19 28,	and beef fresh, preserved, and salted or cured	10,234,109	
124,416 live sheep,	1 48		183,898	
64,979 live hogs,	11 38,	and bacon, hams, and pork	35,023,323	
		Lard	22,900,522	
				68,341,852

1880.

192,756 live cattle,	73 02,	and beef fresh, preserved, and salted or cured	31,544,360	
266,137 live sheep,	4 27,	and fresh mutton	1,068,865	
83,434 live hogs,	5 05,	and bacon, hams, and pork	57,338,964	
		Lard	27,920,367	
				117 872 556

The export of beef-cattle alive to Great Britain and Ireland began properly in 1876, though a trial of the business was made earlier. Live cattle were exported to Great Britain in 1874, but prior to 1876 the animals shipped were almost entirely for breeding purposes, as the average values demonstrate, particularly in 1874 and 1875: $5,850 in the former year, and $663 63 in the latter.

The 125,742 beeves that went to Great Britain in 1880 were shipped from New York, Boston, Charlestown, and Baltimore, and averaged $94 22 in value. Those from Boston, 52,482, averaged the highest value, $97 38; 65,151 from New York averaged $92 83; the Baltimore shipments averaged $91 98. These beeves were graded steers—generally shorthorns—bred and fattened in that section of the United States comprising most of Iowa and parts of Kansas, Nebraska, Missouri, Illinois, Wisconsin, Indiana, Ohio, and Kentucky, and a few from Virginia and scattering localities of the eastern states. From schedules of cattle-feeding and transportation and from testimony collected from the principal exporters and handlers of these live beeves abroad is made the following brief compilation of prominent statistics of the live-cattle export to Great Britain in 1880. The average graded steer bought in the Chicago market at between twenty-six and twenty-seven months of age weighed 1,074 pounds, and cost $35 43 to the feeder, who held him eleven months on corn, hay, and summer pasture, with 14.26 bushels of corn per month, at 27.1 cents per bushel, and hay or grass valued at 81.64 cents per month. The feeding steers are followed by fatting hogs, in the proportion of 1.64 hogs to a steer. The average steer, when sold in Chicago to be moved eastward, weighed 1,507 pounds, was three years and two months of age, and brought $72 34, not including the pork netted to the feeder. The average cost to put one pound of flesh on a steer was 4.59 cents.

The foregoing are the average deductions from the figures of feeders. From the Chicago stock-yards' statistics the average price of export steers in 1880 is made to have been $5 25 per cwt., and the average live weight 1,425 pounds, or to have cost $74 81.

The favorite export cattle are fully ripened, evenly fatted, symmetrical, and between 1,350 and 1,550 pounds in weight. The foreign demand during winter is for heavy beeves—even 1,600 to 1,700 pounds—but such stock is unpopular with the shipper, because additional space is required on shipboard, and the animals, being clumsy, are more liable to injury. The expenses from Chicago to market in Great Britain, consisting of commission for buying, railroad freight to Boston or to New York, feed *en route*, attendance, two days' rest at seaboard, transportation by sea, attendance and feed on sea, and charges in England, including commission for selling, ranged from an average of $36 in summer to an average of $42 in winter. Beeves are bought for export to dress 56 to 57 per cent. They

are sold to weigh 57 to 58 per cent. in the English market. The average selling-price per pound in England during 1880 was 15 cents. This price is for estimated dead weight, sinking the offal, bullocks being slaughtered to net 58 per cent.

Of the cattle shipped to English ports during 1880, a little over 4½ per cent. were lost on the voyages, and shrinkage in weight from Chicago to Liverpool is estimated by exporters to reach 4½ per cent. Sheep suffered to about the same extent, while of hogs over 12 per cent. were lost. Of the losses by rail from Chicago to sea-board reliable figures are not available.

The report of the American Humane Society for 1879 estimated that from 5 to 10 per cent. of the real value of cattle and hogs was lost by shrinkage in weight, by death, and from injury in transit. Several forms of improved stock-cars, with conveniences for feeding, etc., are now on trial.

The loss from shrinkage alone between Chicago and the English market is generally estimated by exporters at 65 pounds per head. Taking 1,450 pounds as the weight of a steer on the Chicago market, destined for Great Britain, which is a little greater than the average weight of all so-called "export cattle" in Chicago, some of which stop in the eastern markets, the better grades only going abroad, and putting his price at $5 25 per cwt., the animal cost $76 12. The expense to English sale averaged $40, taking extremes of the year's freight, making a total cost of $116 12. He weighs, after shrinkage, 1,385 pounds, and, sold to net 57 to 58 per cent., he brings, at the average (15¾ cents), $125 42. This supposes no loss other than shrinkage. With the average loss by sea, the profit of the exporter through the year 1880 would be brought down to an average net profit of $4 08 per head.

The following tables show the number and value of exported cattle, sheep, and hogs, according to distribution, during the fiscal year 1880:

EXPORTS OF NEAT STOCK FOR FISCAL YEAR ENDING JUNE 30, 1880, SHOWING NUMBER AND VALUE, CUSTOMS DISTRICTS FROM WHICH EXPORTED, DESTINATION, ETC.

[Compiled from annual statements of the Treasury Department.]

Exported from—	Number.	Value.	Average value.	Exported to—	Number.	Value.	Average value.
Total from the United States	182,756	$13,344,195	$73 02	Total to foreign countries	182,756	$13,344,195	$73 02
New York, New York	65,151	6,047,914	92 83	England	118,242	11,198,912	94 71
Boston, Massachusetts	52,482	5,110,563	97 38	Scotland	7,275	631,380	86 79
Baltimore, Maryland	8,457	777,846	91 98	Belgium	3,842	342,570	102 50
Philadelphia, Pennsylvania	4,334	354,220	81 73	British West Indies	2,409	152,279	63 21
Portland and Falmouth	1,894	160,229	84 60	France	1,240	135,370	109 17
Norfolk and Portsmouth, Virginia	1,054	92,450	87 71	Denmark	326	35,360	108 47
New Orleans, Louisiana	52	4,835	92 98	Nova Scotia, New Brunswick, and Prince Edward's islands.	277	27,575	99 55
Machias, Maine	2	75	37 50	Ireland	225	17,350	77 11
Fernandina, Florida	1	200	200 00	British Guiana	30	1,441	48 03
Key West, Florida	28,600	400,315	14 00	Dutch Guiana	12	1,085	90 42
Saluria, Texas	16,526	290,929	17 60	French West Indies	6	500	83 33
Corpus Christi, Texas	464	3,758	8 10	Brazil	2	500	250 00
Brazos de Santiago, Texas	489	5,756	13 11	Hayti	1	75	75 00
Galveston, Texas	360	9,000	25 00	Cuba	45,515	703,954	15 47
Savannah, Georgia	57	700	12 28	Mexico	992	10,633	10 72
Saint John's, Florida	6	100	16 67	Quebec, Ontario, Manitoba, and northwest territory.	2,506	63,924	25 51
Minnesota, Minnesota	2,472	63,022	25 49	Hawaiian islands	198	13,574	68 56
Duluth, Minnesota	32	868	27 13	Japan	87	4,995	57 41
Oswego, New York	1	30	30 00	British Columbia	57	1,434	25 16
Vermont, Vermont	1	14	14 00	Central American States	12	1,194	99 50
San Francisco, California	299	19,843	66 36	China	2	80	40 00
Puget Sound, Washington territory	57	1,434	25 16				
San Diego, California	15	94	6 27				

EXPORTS OF SHEEP FOR FISCAL YEAR ENDING JUNE 30, 1880, SHOWING NUMBER AND VALUE, CUSTOMS DISTRICTS FROM WHICH EXPORTED, DESTINATION, ETC.

[Compiled from annual statements of the Treasury Department.]

Exported from—	Number.	Value.	Average value.	Exported to—	Number.	Value.	Average value.
Total from the United States	209,137	$892,647	$4 27	Total to foreign countries	209,137	$892,647	$4 27
Corpus Christi, Texas	75,737	78,169	1 03	Mexico	115,265	120,817	1 05
Brazos de Santiago, Texas	22,940	22,859	1 00	Cuba	62	265	4 27
Saluria, Texas	1,309	7,288	5 57	England	77,940	683,761	8 77
San Diego and San Francisco, California	16,490	23,240	1 41	Scotland	2,561	19,068	7 45
New York, New York	43,091	356,146	8 26	British Guiana	1,973	11,135	5 64
Boston and Charlestown, Massachusetts	37,520	348,003	9 28	British West Indies	1,549	12,727	8 22
Baltimore, Maryland	4,159	23,623	5 68	France	675	5,450	8 07
Philadelphia, Pennsylvania	1,366	20,300	14 86	Belgium	575	5,750	10 00
Puget Sound, Washington territory	5,384	10,778	2 00	Denmark	481	4,110	8 54
Minnesota, Minnesota	1,141	2,241	1 96	Ireland	275	2,150	7 82
				French possessions and all others	80	275	3 44
				Argentine Republic	17	2,000	117 65
				British possessions in Australasia	10	1,500	150 00
				Venezuela	6	50	8 33
				Brazil	2	150	75 00
				United States of Colombia	10	110	11 00
				British Columbia	5,769	11,888	2 06
				Japan	720	8,200	11 39
				Hawaiian Islands	26	1,000	38 46
				Quebec, Ontario, Manitoba, and northwest territory.	1,141	2,241	1 96

EXPORTS OF SWINE FOR FISCAL YEAR ENDING JUNE 30, 1880, SHOWING NUMBER AND VALUE, CUSTOMS DISTRICTS FROM WHICH EXPORTED, DESTINATION, ETC.

[Compiled from annual statements of the Treasury Department.]

Exported from—	Number.	Value.	Average value.	Exported to—	Number.	Value.	Average value.
Total from the United States	83,434	$421,089	$5 05	Total to foreign countries	83,434	$421,089	$5 05
Huron, Michigan	69,665	291,111	4 18	Quebec, Ontario, Manitoba, and northwest territory.	70,140	294,586	4 20
Minnesota, Minnesota	203	1,606	7 91	England	10,399	95,151	9 15
Detroit, Michigan	134	560	4 18	Germany	973	17,510	18 00
Champlain, New York	125	1,264	10 11	Venezuela	10	409	40 90
Vermont, Vermont	7	14	2 00	French West Indies	7	42	6 00
Duluth, Minnesota	5	25	5 00	Cuba	155	1,251	8 07
Genesee, New York	1	6	6 00	Central States of America	4	100	25 00
Boston and Charlestown, Massachusetts	5,641	51,514	9 13	Mexico	544	1,689	3 10
New York, New York	4,532	41,785	9 22	British Columbia	724	4,679	6 46
Philadelphia, Pennsylvania	138	1,090	7 90	Hawaiian Islands	462	5,258	11 38
Baltimore, Maryland	1,080	18,780	17 39	Australasia	8	350	43 75
Fernandina, Florida	7	42	6 00	United States of Colombia	8	64	8 00
Key West, Florida	152	1,186	7 80				
Saluria, Texas	2	15	7 50				
Corpus Christi, Texas	247	664	2 69				
Brazos de Santiago, Texas	38	114	3 00				
Alaska	2	35	17 50				
Puget Sound, Washington territory	716	4,544	6 34				
Willamette, Oregon	5	50	10 00				
San Francisco, California	503	6,163	12 25				
San Diego, California	231	521	2 25				

We find that nearly 73 per cent. of all the neat stock exported that year went from Atlantic ports north of North Carolina to Europe and the provinces thereof, of which total European consumption Great Britain took 94 per cent. in number and an equal percentage in value. From all other Atlantic and Gulf of Mexico ports of the United States there went out not quite 26 per cent. of our total live cattle, of which exports about 62 per cent. were Florida grass-fed animals for Cuba, and 38 per cent. were grass-fed beeves from Texas to Cuba and Mexico, but the 25 per cent. in number of our total export cattle which Cuba and Mexico received represented in value only about 5½ per cent. Whilst our cattle in Europe and its provinces averaged $94 05 per head, those to Cuba and Mexico averaged but $15 37.

From the Pacific coast there were exported 371 live cattle, at an average value of $57 60, distributed as the table shows.

Our northern boundary is credited with an export of 2,506 head into the British provinces, but there is reason to believe, from information gathered, especially in Washington territory and Montana, that many found market beyond the United States without record in the customs offices.

The trade to the British West Indies and Honduras began in 1851, and has continued to the present date, taking grain-fed cattle of good class from the eastern states at a value of from $60 to $80. The Cuban demand began about the same time, but for a far different class of animals. Florida and Texas long-horned Spanish range cattle have supplied Cuba at an average value per head of from $13 to $18.

BEEF, SALTED OR CURED.

The exports of beef, salted or cured, were prominent long before the introduction of what is known as "preserved meat", *i. e.*, cooked or fresh meats packed in hermetically sealed tin cans. Twenty years ago—in 1861—the exports of salted and cured beef amounted to 154,957 barrels and tierces, valued at $2,674,324, or about 6¼ cents per pound. In 1865 there were shipped abroad 110,214 barrels and tierces, valued at $3,304,771, or about 12 cents per pound.

The barreled corn-beef business reached its height in 1864. As canning came into practice the business in barreled beef gradually diminished. In 1870, 26,727,773 pounds of salted or cured beef were exported, worth $1,939,778, or 7¼ cents per pound. In 1875 the exports amounted to 36,036,537 pounds, worth $2,956,676, or 8⅛ cents per pound. In 1880 the quantity reached 45,237,472 pounds and a value of $2,881,047, a fall in average price to 6$\frac{4}{10}$ cents per pound. That year's exports from New York were 33,177,678 pounds, valued at $2,210,271, or 6⅔ cents per pound; of which England received 22,928,787 pounds; Scotland, 6,634,314 pounds; and the British West Indies, 2,722,512 pounds.

BEEF, PRESERVED.

In 1864 the exports of beef, preserved otherwise than by salting or curing, are recorded at a value of $1,936,884. In 1865 it fell to $134,981; England received the value of $32,811; China, $10,532; and Australia, $8,064. After 1865 the value of the export increased very slowly but steadily, until in 1875 it reached $735,112; in 1876 it reached a value of $998,052; in 1880 the value was $7,877,200, distributed in the main as follows:

To England	$5,632,385
To Scotland	961,010
To Germany	389,823
To Quebec, Ontario, Manitoba, and northwest territory	210,744
Total	7,193,962

Of this valuation $7,163,129 went from New York.

In five years our exports of preserved beef increased nearly eightfold, and Great Britain and Ireland, taking 58 per cent. in 1876, took 83 per cent. in 1880. In 1880 a single packing-house in Chicago used an average of 1,500 carcasses per day. The carcasses come to the packing-house dressed; they are then reduced and given to cutters, who separate the meat from the bone; what yet adheres is rendered in steam for the tallow. The bone and what else is rejected from the tallow go to fertilizing companies. The meat—except hams, which are sweet pickled, smoked, or dry salted to barrel, and the plate pieces—is canned. The average weight of the cattle slaughtered for the purposes of this business is 950 pounds. They are Texas and western-plain animals, costing, at the average of 1880, $2 90½ per cwt. The meat handled represents 48 per cent. of dead weight. Boning and cutting leave a net product to be manufactured equal to 50 per cent. of the above, or from 228 to 235 pounds per animal. About three-quarters of this is canned. There are two treatments for canning. One is for the square cans of 2, 4, 6, and 14 pounds. For these the meat is boiled before canning and then pressed into the cans and sealed; the cans with their contents are placed in boiling vats, the tins being pierced for the escape of steam. After cooling the punctures are sealed. The other system is for meat packed raw in round cans of 2, 4, and 6 pounds. These are cooked in a chloride of calcium bath at a temperature of 260° to 270° F., a vent being left for the steam to escape. Sealed and dried they shrink, owing to the partial vacuum within; the top and bottom collapse and become concave, tightly pressing their contents.

FRESH MEATS.

The first shipments of fresh beef were made from New York to England in the fall of 1875. Fresh mutton exports began in 1877. From the amount of 48,243,251 pounds fresh beef, valued at $4,197,956, averaging 8.7 cents per pound in 1875, the export increased to 84,717,194 pounds, valued at $7,441,918, and an average of 8.8 cents, in 1880.

Fresh mutton exports, beginning with 349,368 pounds, valued at $36,480, or 10.4 cents per pound, grew to 2,335,855 pounds, valued at $176,218, or 7½ cents per pound, in 1880. Of our fresh beef shipments in 1880, Great Britain took 99.6 per cent. in amount and 99.7 per cent in value. Of the fresh mutton she received 99.8 per cent. in amount and 99.9 per cent. in value. It is to be noted in this connection that of the aggregate valuation of all meat exports of the United States for the fiscal year ending June 30, 1880, Great Britain and Ireland took 65⅝ per cent., as tabulated below:

TOTAL EXPORTS TO GREAT BRITAIN (ENGLAND, SCOTLAND, AND IRELAND) OF CATTLE, SHEEP, AND HOGS, AND THEIR PRODUCTS FROM THE UNITED STATES DURING FISCAL YEAR ENDING JUNE 30, 1880.

	Number.	Pounds.	Average value.	Value.
Total value of all exports				*$77,405,552
Live cattle	125,742		$94 22	11,847,642
Fresh beef		84,454,881	8.70	7,425,255
Preserved meats				6,627,345
Salted or cured		29,592,601	6.40	1,893,103
Value live cattle and beef products				27,793,345
Live sheep	80,776		8 73	704,979
Fresh mutton		2,332,824	7.55	176,058
Value live sheep and mutton				881,037
Live hogs	10,399		9 15	95,151
Bacon and hams		555,013,833	6.80	37,737,609
Pork		36,997,976	6.87	2,543,410
Value live hogs and hog products				40,376,170
Value lard		112,834,201	7.4	8,355,000

* Or 65⅝ per cent. of the aggregate valuation of the meat exports of the United States during the fiscal year ending June 30, 1880.